



Chelsea Physic Garden
1673

PROCEEDINGS
OF THE
LINNEAN SOCIETY OF LONDON.



125TH SESSION.

FROM NOVEMBER 1912 TO JUNE 1913.

LONDON:
PRINTED FOR THE LINNEAN SOCIETY,
BURLINGTON HOUSE, PICCADILLY, W.
1913.

PRINTED BY TAYLOR AND FRANCIS.

RED LION COURT, FLEET STREET.

CONTENTS.

	Page
List of Publications issued	iv
Proceedings of the 125th Session	i
Presidential Address	26
Obituaries	49
Abstracts of Papers	69
Additions to the Library	73
Benefactions, 1790-1913	91
Index	99

SUPPLEMENT.

PUBLICATIONS: SESSION JULY 1912-JULY 1913.

Journal, Botany.

Vol. XLI.	No. 280.	8/-
	„ 281.	6/-
	„ 282.	8/-

Journal, Zoology.

Vol. XXXII.	No. 213.	4/-
	„ 214.	4/-
	„ 215.	4/-

Transactions, Botany.

Vol. VII.	Part 19.	3/-
	„ 20.	3/-
Vol. VIII.	„ 1.	20/-
	„ 2.	8/-

Transactions, Zoology.

Vol. XI.	Part 11.	4/-
	„ 12.	8/-
Vol. XV.	„ 2.	24/-
	„ 3.	26/-
	„ 4.	12/-
Vol. XVI.	„ 1.	24/-

Proceedings, 124th Session, October 1912.

List of [Fellows, Associates, and Foreign Members], Nov. 1912.

PROCEEDINGS
OF THE
LINNEAN SOCIETY OF LONDON.

(ONE HUNDRED AND TWENTY-FIFTH SESSION,
1912-1913.)

November 7th, 1912.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 20th June, 1912, were read and confirmed.

Mr. Bernard Francis Cavanagh, Dr. Reginald Ruggles Gates, Ph.D. (Chicago), Miss Alice Hibbert-Ware, Mr. Arthur Edward Peck, Mr. Francis Henry Sikes, M.A., Mrs. Beatrice Stuart (*née* Norbury, Mrs. Charles Urquhart Stuart), Mr. Henry Edward Irving Taylor, M.A. (Cantab.), and Capt. Sidney Miles Toppin, R.A., were proposed as Fellows.

The Treasurer referred to a set of Syme's edition of Sowerby's 'English Botany' which had been bought out of the income of the Tagart Bequest, and hoped that each succeeding year would see a similar accession.

The first paper was by Dr. R. R. GATES, "On Mutating *Oenotheras*," which was communicated by Prof. J. B. FARMER, F.R.S., F.L.S.

In the discussion which followed, Prof. W. Bateson, Dr. Otto Stapf, and Prof. Dendy took part, and the author replied.

Mr. FREDERICK ENOCK, F.L.S., showed a series of lantern-slides illustrating the life-history of British Mymaridæ and their hosts.

The last paper was by Mr. HENRY N. RIDLEY, F.R.S., F.L.S., on a collection of plants from Mount Menuang Gasing, Selangor, made by Mr. C. B. KLOSS in February 1912. One hundred and forty-three species were collected, of which 14 were undescribed: of these the most noteworthy were what is probably the biggest species of the large genus *Oberonia*, a remarkable species of *Blastus*, and a new species of *Balanophora*.

Dr. A. B. Rendle and Mr. H. N. Dixon discussed certain points, and the author replied.

November 21st, 1912.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 7th November, 1912, were read and confirmed.

Mr. Frank Arthur Stockdale, B.A. (Cantab.), was admitted a Fellow.

Mr. John Davidson was proposed as a Fellow.

Mr. Ernest John Bickford, Mr. Thomas Ford Chipp, B.Sc. (Lond.), Mr. Alfred Eugène Craven, Mr. Nevin Harkness Foster, M.R.I.A., M.B.O.U., Mr. William Norman Sands, and Mr. Francis James Stayner, were elected Fellows.

Dr. A. B. RENDLE, F.R.S., F.L.S., exhibited specimens, and showed a series of lantern-slides, illustrating Mr. P. AMAURY TALBOT's collection of plants from Southern Nigeria.

Dr. Stapf, F.R.S., Sec.L.S., Mr. E. G. Baker, and Dr. Lambourn (visitor) contributed further remarks.

The Rev. GEORGE HENSLOW, M.A., F.L.S., then gave the substance of his paper, "On Vegetable Mechanics," as follows:—

The object of this paper is to show that plants respond to gravity, strains, and stresses, in order to resist them and so secure stability. Kerner thought that the stems of herbs and the trunks of trees were constructed on a combined system of girders; but if a tree has a heavy mass of foliage borne at the summit of a tall cylindrical stem (as of Mahogany), or even a short one (*Fagus Rumphii*), buttresses are often formed by the roots, which enable the tree to keep the centre of gravity over an extended base.

If the stem be hollow, diaphragms are introduced to render it secure. These are in some cases cup-shaped as in East Indian Bamboos, thereby securing a greater "pull" against lateral stress.

In tropical lianes, various mechanical contrivances secure strength with elasticity. In *Bauhinia* there are cup-shaped

bulgings on either side of a flattened stem. In the Monkey-ladder (*Caulotretus*), besides the bulgings, flanges are added on the edges making a complete girder.

In Cucurbitaceæ and *Passiflora* the tendril coils, after securing a hold by its curled tip, the coiling being in opposite directions. This is secured by a "crank" being first formed which rotates.

In leaves, the distribution of the mid-rib and veins secures the blade from transverse bending and tearing. In Bananas, the leaves, being degenerate in character, are invariably torn to shreds by the wind.

In flowers adapted to insects, various mechanical contrivances enable the calyx and corolla, or the stamens, to support the insect; while others enable it to carry the pollen away. The calyx multiplies its ribs and the corolla expands anteriorly, while the stamens become levers, &c.

Fruits are often subject to strains as in bursting, but if a pear hang vertically from an oblique stalk, there is a tendency to tear itself away. Nature then develops a hump at the base which counteracts the resultant of the two other forces.

Dr. O. Stapf, the Rev. T. R. R. Stebbing, F.R.S., and the President spoke on this paper, and the author replied.

The last paper, by Miss NELLIE BANCROFT, B.Sc., F.L.S., "On some Indian Jurassic Gymnosperms," was read in abstract by the Secretary for Botany.

December 5th, 1912.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 21st November, 1912, were read and confirmed.

Mr. Thomas Ford Chipp, B.Sc. (Lond.), was admitted a Fellow.

Mr. John Harrison was proposed as a Fellow.

Mr. Bernard Francis Cavanagh, Dr. Reginald Ruggles Gates, Ph.D. (Chicago), Miss Alice Hibbert-Ware, Mr. Arthur Edward Peck, Mr. Francis Henry Sikes, M.A., Mrs. Beatrice Stuart (*née* Norbury, Mrs. Charles Urquhart Stuart), Mr. Henry Edward Irving Taylor, M.A. (Cantab.), and Capt. Sidney Miles Toppin, R.A., were elected Fellows.

The first communication was by Mr. E. J. BEDFORD, entitled "Notes on two Orchids new to East Sussex: Further Notes on

several rarer species of the Orchidaceæ," and communicated by Mr. C. E. SALMON, F.L.S.

The lecturer stated that he is engaged in obtaining a series of photographs of the British Wild Orchids, his intention being to secure photographs of every possible species *in situ*, as well as at closer quarters at home, when arranged against a plain background. During the season of 1911 he was fortunate enough to obtain two species not hitherto recorded for East Sussex. The first of these was the Brown-veined Orchid, *Orchis purpurea*, found in the Ouse district, near Lewes, in the month of May by Mr. Herbert Jenner, of Lewes.

This interesting find was the prelude of another of perhaps even greater interest, for in the month of June the lecturer found a specimen of the rare Lizard Orchid, *Orchis hircina*, in the Cuckmere district near Eastbourne.

This also proved to be a record for East Sussex, although a single specimen was discovered in West Sussex in 1907 near the border of the county. When discovered the specimen was only just coming into blossom, but it was decided to pick and take it home. The plant measured $12\frac{1}{2}$ inches in height and doubtless would have grown higher had it been left. The flowers opened at the rate of three or four each day during the time it was kept indoors, and about a week after the specimen had been picked all the flowers were open except those at the extreme tip.

It was, at this stage, taken back and temporarily fixed to its own stalk and photographed *in situ* on 22nd June. The plant did not produce a bloom during the past season (1912), although several leaves appeared, so it is hoped it may bloom again this season.

Earlier in the same year (1911) he had found a numerous colony of the Spider Orchid, *Ophrys aranifera*. In a circular space of about 3 yards radius he counted 65 specimens, and they were in this profusion for a considerable distance on each side.

The specimens which occur in Sussex are said to be *Ophrys aranifera* var. *fucifera*: great difficulty was experienced, however, in distinguishing the variety from the type which is said to occur in Kent and sometimes in Sussex.

During the past season (1912) he was able to photograph *in situ* the rare Late Spider Orchid, *Ophrys arachnites*, in the Folkestone district.

Another interesting species to be found in Sussex, although in decreasing numbers, is the Bog Orchid, *Malaxis paludosa*. From its size and position this is a difficult species to photograph *in situ*. There is little doubt that the specimen Darwin experimented with and mentioned in his 'Fertilisation of Orchids' came from the same locality as the one shown.

He supposed that he would be correct in calling the Fen Orchid, *Liparis Loeselii*, one of the rarest of the family. Through the kindness of a distinguished botanist he was able to obtain a photograph of it growing during 1912, but was not at liberty to divulge the exact locality.

The last species mentioned was the Summer Lady's Tresses, *Spiranthes aestivalis*, which he was also able to show photographed as it grew.

His collection of photographs at present consists of 33 species and varieties out of a possible 44, and he should be very glad of an opportunity of adding to his collection any species not yet obtained.

A discussion followed in which Mr. G. Claridge Druce, the Rev. T. R. R. Stebbing, F.R.S., Mr. E. G. Baker, and Mr. T. A. Dymes took part, and Mr. Bedford briefly replied.

Professor W. A. HERDMAN, F.R.S., F.L.S., read his paper entitled "*Spolia Runiana*.—I. *Funiculina quadrangularis* (Pallas) and the Hebridean *Diazona violacea*, Savigny," and exhibited a series of the more important invertebrates which he had obtained in Hebridean Seas in 1912, by trawling and tow-netting from his steam-yacht 'Runa.'

This paper was discussed by Mr. A. O. Walker, the Rev. T. R. R. Stebbing, F.R.S., Prof. Dendy, F.R.S., Mr. John Hopkinson, and Dr. W. T. Calman.

Miss MAUD UMFREVILLE CLARKE exhibited a series of photographs of natural objects, together with some finished in body-colour. She uses the photographs as a basis for correct outline, and styles the process "Nature Camera-work"; the result being totally unlike a coloured photograph, and more resembling small pictures in oil-colours.

These having been introduced by the General Secretary, critical remarks were contributed by Mr. G. Massee and Dr. Tempest Anderson, Miss Clarke replying.

Miss MARY W. JOHNSTONE showed a series of 125 water-colour drawings from South Africa, stating that these sketches were made from the wild flowers of the veldt, which were all found within a three-mile radius of Roodekop Station—a small place about 15 miles south of Johannesburg.

They represent the chief flowers of a whole season, the early ones appearing when the first showers of rain begin in October; some flower almost as soon as the heavy dews commence, and spring up from the hardest ground, without any visible moisture. The season for wild flowers in the Roodekop district usually ends in April.

All these wild flowers grow on the bare open veldt, without any shade or protection, except what the tall grass affords. Many are much sought by the wild bees, and from them some of the purest veldt honey is obtained, the wild cotton-plant being one of the favourite "bee-plants."

Three sketches of flowers from Table Mountain were also shown.

Dr. Stapf, F.R.S., Sec.L.S., and Mr. John Hopkinson, who introduced the exhibition, spoke on the subject.

December 19th, 1912.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 5th December, 1912, were read and confirmed.

Dr. Charles Edward Moss, Mr. Francis Henry Sikes, and Miss Alice Hibbert-Ware, were admitted Fellows.

The Rev. Henry Bride Barber, and Mr. Edward Thomas Browne, M.A. (Oxon.), were proposed as Fellows.

Mr. John Davidson was elected a Fellow.

The President having, in accordance with previous announcement, declared the Meeting to be made a Special General Meeting for the election of a member of the Council in the place of Mr. Henry Groves deceased, the General Secretary read the Bye-Laws governing such election, and the Fellows present proceeded to vote.

The Ballot having been closed, the President appointed Dr. A. B. Rendle, Mr. A. D. Michael, and Mr. John Hopkinson, Scrutineers, and the Votes having been examined and cast up, they reported to the President, who thereupon declared that Sir Frank Crisp, J.P., had been elected a Councillor.

The President announced that the Council had that afternoon sent a telegram of congratulation to Sir JOHN KIRK, G.C.M.G., who had attained his 80th birthday, having been born on the 19th December, 1832.

Mr. CECIL H. HOOPER then gave an account entitled "Experiments on the Pollination of our Hardy Fruits, with observations on the Insect visitors to the blossoms," illustrating the same with lantern-slides. He stated that strawberries, provided there is wind, set fruit well without insects. Raspberries and loganberries generally set fruit imperfect in shape if insects are excluded. Red, white, and black currants and gooseberries, owing to the construction of their flowers and pollen (which is glutinous), cannot be pollinated and set their fruit without the visits of insects, more particularly hive and humble bees. All the previously-mentioned plants set fruit perfectly with pollen of the same variety or even of the same flower; but with the apple, pear, plum, and cherry, this is not always the case, many varieties being self-sterile, and almost all produce more abundant

and finer fruit with pollen of another variety. In these trees there is very little transference of pollen by the wind, and even if a self-fertile tree is enclosed in muslin whilst in blossom (there being ample movement of the wind, insects only being excluded), it is the exception for any fruit to set; it is the same with gooseberries and currants. In trials with apples, only 19 varieties out of 65 proved self-fertile; in pears, 4 out of 30; in plums, 21 out of 41; in cherries, 5 out of 12: whilst, when cross-pollinated, in three quarters of the trials one or more fruits set on a truss.

There seems to be a preference as to pollen, some varieties setting better with pollen of one variety than that of another. The knowledge of the usual order of blossoming is useful as a guide for interplanting varieties, so as to choose varieties that flower about the same time for planting together.

Out of nearly 3000 insects observed last spring visiting the blossoms of the various fruit bushes and trees, 88 per cent. were hive-bees, $5\frac{1}{2}$ per cent. humble and other wild bees, and $6\frac{1}{2}$ per cent. flies, ants, beetles, wasps, and other insects; but the latter group have not fluffy bodies for carrying and transferring pollen, and chiefly eat the pollen, and are not therefore as useful as the hive and wild bees.

A discussion followed, the participants being Mr. F. J. Chittenden, Dr. R. R. Gates, Dr. A. B. Rendle, Mr. J. C. Shenstone, Dr. Stapf, Mr. H. R. Darlington, and Dr. A. P. Young, the author replying.

Dr. OTTO STAPF, F.R.S., Sec.L.S., then gave an abstract of a paper by Mr. H. M. CHIBBER on the Morphology and Histology of *Piper Betle*, Linn., which had been communicated by Dr. HAROLD H. MANN, F.L.S.

Mr. A. O. WALKER sent for exhibition a twig of fasciated holly, *Ilex Aquifolium*, in which some of the berries also had coalesced.

Dr. OTTO STAPF, F.R.S., Sec.L.S., exhibited specimens of Wild Rice, annual and perennial. He defined "Wild Rice" as including all spontaneously growing forms of *Oryza*, which, as far as the structure of their spikelets is concerned, might be considered as conspecific with *Oryza sativa*, except that their spikelets are readily deciduous when mature. He showed in a map the present extension of rice-cultivation, and traced briefly its history; whilst another map demonstrated the area of the genus *Oryza*, with the exclusion of cultivated rice. He then pointed out the main areas of "Wild Rice," as defined above:—(1) in North Australia; (2) in India, with extensions to Cambodja and possibly Borneo; (3) in tropical Africa from Abyssinia to the Niger; (4) in Senegambia and possibly extending to the region of Lake Tchad; (5) in South America. The "Wild Rices" of areas 1-3 and possibly some of

area 5 are annual, the remainder perennial. He concluded with the suggestion that the domesticated rices are probably polyphyletic, most having originated from the Wild Rices of area 2, and some from those of area 3 and possibly 5.

Dr. Rendle, the President, and the General Secretary contributed further remarks, Dr. Stapf replying.

Mr. J. T. N. THOMAS exhibited an aquatic plant, a long-leaved form of *Elodea canadensis*, Nutt., in which the rotation of the protoplasm could be observed better than in the normal form. He had obtained it from a tank containing goldfish in a small shop, and all the information he could obtain was that it came with the fish from "France."

Miss MAY RATHBONE brought a fresh inflorescence of the banana, *Musa sapientum*, Linn., as an exhibition.

January 16th, 1913.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 16th December, 1912, were read and confirmed.

Mr. Henry Edward Irving Taylor, M.A. (Cantab.), was admitted a Fellow.

Mr. James Ebenezer Black, F.E.S., and Mr. Banawari Lal Chandhuri, B.A., B.Sc. (Edin.), F.R.S.E., were proposed as Fellows.

Mr. John Harrison was elected a Fellow.

The President announced that the Council had decided to apply the bequest of £100 left by Sir JOSEPH HOOKER to the Society, as the nucleus of a fund to be styled "The Sir JOSEPH HOOKER LECTURE" Fund, of which particulars will be given at the next General Meeting.

Prof. G. C. BOURNE, F.R.S., Sec.L.S., then gave an account of the visit to Madagascar by the Hon. PAUL METHUEN in search of subfossil Lemuroids, illustrating his remarks by lantern-slides of the country traversed.

Dr. Smith Woodward, Mr. de Gaye, and the President discussed certain aspects of the report.

Mr. T. F. CHIPP, F.L.S., gave an exhibition of African Mahogany (*Khaya* sp.) bored by *Xylotrya*, and of Mangrove (Rhizophoraceæ) bored by *Teredo* sp. [A report by Mr. Chipp on "Mahogany borers of the Gold Coast" was published in the Kew Bulletin, 1913, p. 72.]

Dr. O. Stapf, F.R.S., Sec.L.S., commented on the facts, and Mr. Chipp replied.

Prof. J. STANLEY GARDINER, F.R.S., F.L.S., having communicated the four following papers forming a portion of the reports on the Percy Sladen Expedition to the Indian Ocean, they were read in title as follows :—

Prof. E. L. BOUVIER.—"Les Caridines des Seychelles, avec des observations sur leurs variations."

The Rev. A. E. EATON.—"Psychodidæ of the Seychelles."

—— "Ephemeridæ of the Seychelles."

Mr. HERBERT CAMPION.—"Odonata of the Seychelles."

The Rev. T. R. R. Stebbing, F.R.S., the President, and Prof. G. C. Bourne, F.R.S., Sec.L.S., contributed additional remarks on Prof. Bouvier's paper.

Mr. W. A. HARDING, F.L.S., then contributed a paper "On a new Land Leech from the Seychelles," one of the same series as the last four papers. He named the new animal "*Idiobdella seychellensis*, gen. and sp. nov."

Mr. G. CLARIDGE DRUCE, F.L.S., reported on six recently discovered new British Plants, including *Spergularia atheniensis*, Heldr. & Sart.

Mr. C. E. Salmon, Mr. F. N. Williams, Dr. O. Stapf, Mr. H. N. Dixon, and Miss R. Cardew spoke in connection with these novelties.

The General Secretary read a letter from Dr. GEORGE HENDERSON, F.L.S., received that morning with specimens of *Alnus glutinosa*, Medic., and what he regarded as *A. incana*, Medic., the latter showing catkins discharging pollen freely in December, whilst those of the former still remained closed.

February 6th, 1913.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 16th January, 1913, were read and confirmed.

Dr. Reginald Ruggles Gates was admitted a Fellow.

Prof. Ethelbert Blatter, S.J., Mr. Jal Phirozshah Mullan, M.A., Mr. Cyril West, and Mr. Robert Whympers, were proposed as Fellows.

The Rev. Henry Bride Barber, and Mr. Edward Thomas Browne, M.A. (Oxon.), were elected Fellows.

The President, in accordance with his announcement at the last meeting, read the following statement to be embodied in a circular to the Fellows:—

The Council of the Linnean Society have had under consideration the application of the bequest of £100 left to the Society by the late SIR JOSEPH HOOKER. They feel that the Fellows of the Society would not desire this legacy to be applied to the ordinary purposes of the Society, but that they would wish it to be used for some memorial of the illustrious donor in connection with the Society. Such a memorial would be peculiarly appropriate, since the late Sir Joseph Hooker was for nearly seventy years one of the strongest supporters of the Society, taking the keenest interest in its work.

The Council have agreed that the most suitable memorial would be an adequately endowed SIR JOSEPH HOOKER LECTURE to be delivered every second, third, or fourth year, and to be published by the Society. They propose that the Lecture be on some subject especially associated with the name of Sir Joseph Hooker, and that the Lecturer be appointed by the Council, not necessarily from among the Fellows of the Society. They suggest that the generous bequest of £100 should form the nucleus of a Fund to be raised for the purpose of carrying this proposal into effect. The Council are gratified to know that their proposal meets with the warm approval of Lady Hooker.

The Council consider that a total sum of not less than £600 should be obtained, and confidently appeal to the Fellows of the Linnean Society and others to contribute.

Mr. A. O. WALKER showed specimens, in flower from his garden, of (1) yellow wallflower, (2) *Cheiranthus* "Harpur-Crewe," and (3) *Erysimum helveticum*, DC.?, pointing out that the respective smell was the only available method of determining the affinity of the second plant, as it was invariably double and never seeded, so that propagation only took place by cuttings.

Mr. ARTHUR W. SUTTON, F.L.S., read a paper on "Wild Pea crosses," illustrated by a lantern exhibition of Lumière slides in colour photography showing the results of crosses between a wild pea from Palestine, presumably *Pisum humile*, Boiss. & Noé, with cultivated forms. This was followed by a series of Lumière lantern-slides of various botanical subjects.

Prof. F. Keeble, Miss Saunders, and Dr. Stapf, Sec.L.S., joined in a discussion, and Mr. Sutton answered some questions which had been put.

Miss N. BANCROFT, B.Sc., read a paper entitled "*Rhexoxylon africanum*, a new Medullosean Stem."

Dr. D. H. Scott contributed some remarks on the interesting fossil which formed the subject of this paper.

Prof. G. C. BOURNE, Sec.L.S., exhibited a very large specimen of the humerus of an extinct tortoise from Madagascar, and compared it with specimens at the British Museum.

Dr. ROGER VERITY's paper, "Revision of the Linnean Types of Palæarctic Rhopalocera," communicated by the President, was briefly explained by the General Secretary.

February 20th, 1913.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 6th February, 1913, were read and confirmed.

Miss Grace Bigby, B.Sc. (Lond.), was proposed as a Fellow.

Mr. James Ebenezer Black, F.E.S., and Mr. Banawari Lal Chandhuri, B.A., B.Sc. (Edin.), F.R.S.E., were elected Fellows.

The President announced that at the next Meeting, 6th March, a nomination would be made for a Foreign Member to fill the vacancy caused by the death of Prof. Eduard Strasburger, reported on the 24th May, 1912.

Prof. G. C. BOURNE, F.R.S., Sec.L.S., gave a general account of a paper by Mr. ROLAND H. DEAKIN, on the Anatomy of the larva of *Phryganea stricta*, which had been communicated by Prof. A. DENNY, F.L.S.

Dr. OTTO STAPF, F.R.S., Sec.L.S., gave a lantern exposition entitled: Views of *Spartina* vegetation, showing the rapid spread of *S. Townsendii*, H. & J. Groves, over the tidal mud-flats on the South Coast from Chichester to Poole.

A discussion followed in which the following engaged: Dr. A. B. Rendle, Dr. C. E. Moss, Mr. James Groves, Mr. J. C. Shenstone, Prof. G. C. Bourne, the Rev. T. R. R. Stebbing, and the President, Dr. Stapf replying.

Dr. STAFF showed an abnormal fruit of Sycamore, *Acer Pseudo-platanus*, on behalf of Mr. W. B. TURRILL, and read the following statement:—

The specimen was found near Woodstock, Oxfordshire, on September 16th, 1912.

There are seven distinct carpels, six of which have perfected seeds. The fruit is apparently composed of two parts, the larger having four carpels, each of which has perfected seeds, and the smaller three carpels, one of which is sterile, though a good wing has been produced.

Transverse sections through the pedicel were compared with similar sections made through the pedicel of a normal two-winged fruit. There are slight differences in structure between the two sets of sections, but nothing to indicate so large an increase in vascular strands as might be expected if two or three flowers had fused together.

O. Penzig ("Pflanzen-Teratologie," vol. i. p. 364) makes the following statements concerning an increase in the number of carpels of the flowers and fruits of the Sycamore:—"An increase in the number of carpels in the flower is very frequent. Three, four, five, and even eight carpels have been seen in one flower. The accessory carpels are often inserted somewhat higher than the normal ones, so that (in four-winged fruits) the pistil appears to be made up of two decussate pairs of carpels."

A paper by Mr. W. BOTTING HEMSLEY, F.R.S., F.L.S., on the Genera *Radamea*, Benth. and *Nesogenes*, A. DC., was read in abstract by the Botanical Secretary.

The last paper, by Prof. R. J. HARVEY GIBSON, F.L.S., and Miss MARGARET KNIGHT, B.Sc., on Marine Algæ collected by Mr. Cyril Crossland in the Red Sea, Part II., was mainly a list of species, 46 in number, 35 of which are additions to the former list.

March 6th, 1913.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 20th February, 1913, were read and confirmed.

Mr. Charles Oldham, F.Z.S., M.B.O.U., and Mrs. Rose Haig Thomas, were proposed as Fellows.

Dr. Hermann von Vöchting, Professor of Botany in the University of Tübingen, was proposed as a Foreign Member.

Prof. Ethelbert Blatter, S.J., Mr. Jal Phirozshah Mullan, M.A., F.E.S., Mr. Cyril West, B.Sc. (Lond.), A.R.C.S., and Mr. Robert Whympre, were elected Fellows.

The President announced that the next General Meeting of the Society on the 3rd April would be made Special, in order to consider the following motions :—

1. That the Wallichian Herbarium and later additions from Dr. Horsfield and others be offered to the Royal Botanic Gardens, Kew.
2. That certain papers relating to the University of Uppsala be presented to that University.

A discussion on "The Development and Inheritance of Sexual Characters" was opened by Mr. GEOFFREY SMITH, M.A., F.L.S., the following being an abstract of his remarks :—

Secondary sexual characters may be divided into two classes, (1) those which are correlated in their development with the primary sexual organ, ovary or testis, and (2) those which are not thus correlated, but which develop independently of the presence of the gonad.

Corresponding to these two classes we find that abnormal secondary sexual characters may arise in an individual in two ways—(1) by *differential correlation*, where abnormality of the gonad causes abnormality in certain secondary sexual characters, (2) by *hereditary transference*, where certain secondary characters are transferred in inheritance from one sex to the other without the primary sexual organs being in the least affected.

In dealing with the first class of cases, the most commonly accepted view as to the mechanism by which the correlation between gonad and secondary sexual characters is brought about, is embodied in the *hormone theory*, according to which the gonad produces a specific hormone which stimulates the development of certain characters. Objections will be raised to this theory in its simple form, chiefly owing to certain phenomena occurring in Parasitic Castration, and an alternative theory of *metabolic stimulation* is proposed, according to which the gonad by feeding on certain specific substances in the blood, stimulates the overproduction of these substances by the metabolic organs, and so brings about changes in the composition of the blood which act as a stimulus on the secondary sexual characters. In the case of the female organism evidence is produced to show that these substances are of a fatty nature.

The last topic of discussion is the factorial composition of the individual in respect of the sexual characters, and the question of the determination of sex.

Evidence is forthcoming chiefly from two sources, breeding and

cytology. It will be argued that it is impossible, at present, to frame a scheme which will include all the known facts, without making both sexes "heterogametic," and consequently assuming that some form of selective fertilization must occur.

Evidence in favour of the occurrence of something tantamount to selective fertilization will be produced in the case of hybrid pheasants, where the preponderance of males over females cannot be accounted for by a selective death-rate occurring at any but an exceedingly early period of development.

The discussion was continued by the President, Mr. L. Doncaster (visitor), Prof. W. Bateson, F.R.S., Mr. F. H. A. Marshall, Mr. J. T. Cunningham, Prof. E. W. MacBride, F.R.S. (the last three being visitors), Prof. E. A. Minchin, F.R.S., Dr. W. T. Calman, and Prof. G. C. Bourne, F.R.S., Sec.L.S., the author replying.

April 3rd, 1913.

Prof. J. STANLEY GARDINER, M.A., F.R.S., Vice-President,
in the Chair.

The Minutes of the General Meeting of the 6th March, 1913, were read and confirmed.

Mr. James Ebenezer Black was admitted a Fellow.

Miss Grace Bigby, B.Sc. (Lond.), was elected a Fellow.

Mr. Robert Paulson, F.R.M.S., was proposed as a Fellow.

The Vice-President in the Chair remarked that it was sometimes pleasant to break away from formal routine, as in the case of one who had been a Fellow since 1868 and a Secretary since 1880; he therefore suggested that all present should join in wishing Dr. JACKSON many happy returns of this, his birthday, long life, and continued health.

The General Secretary, in acknowledging this suggestion and its cordial adoption by the meeting, said that the motion had taken him by surprise, so that he was not prepared adequately to express his thanks and pleasure; he was glad to recall that by the favour of the Fellows he had been continued in his office for a longer period than any of his predecessors, and having devoted many of his best years to the service of the Society,—a service in which he delighted—he hoped still to be able during the remainder of his official life to advance the welfare of the Linnean Society of London.

The Chairman then, in accordance with previous notice, moved the following resolutions of the Council:—

1. That the Wallichian Herbarium and later additions from Dr. Horsfield and others be offered to the Royal Botanic Gardens, Kew.
2. That certain papers relating to the University of Uppsala be presented to that University.

A ballot being taken in accordance with the Bye-Laws, Chap. XIII. Sect. 8, the Chairman declared the Resolutions adopted.

Mr. C. E. SALMON exhibited a large series of forms of *Alchemilla vulgaris*, Linn. He stated that the species of *Alchemilla* are easy to collect and dry. They are not difficult to name as compared with *Euphrasia* or *Hieracium*, thanks to Dr. H. Lindberg's excellent Monograph published in 1909. He had placed Dr. Lindberg's volume upon the table, and, with three exceptions, all the forms mentioned by him were represented in a dried state.

There are three main Sections, *Pubescentes*, *Hirsutæ*, and *Subglabræ*.

A. pubescens, Buser, represents the first section (which also includes *A. hirsuticaulis*, Lindb., and *A. plicata*, Buser); all these are more or less wholly densely sericeous. *A. pubescens* is not British, but it was shown to him last year in a wild situation in Surrey, where, on investigation, it was proved that its origin was a garden not very far away, whence it had been brought from Norway about 20 years ago.

In the *Hirsutæ* section, we get three out of the four British species. The first, *A. pratensis*, Schmidt, is widely distributed over the British Isles and Ireland; the glabrous flowers, hairy stem, and glabrous upper leaf-surface help to distinguish it. *A. minor*, Huds., is the next and is our most frequent form; may be known by its hairy pedicels and flowers. The third, *A. minor*, subsp. *flicaulis*, Lindb., is extremely local in Britain (only occurring in a few stations in Scotland), but widely distributed in Norway, Sweden, the Faroes, etc.; it is less hairy in all its parts than *A. minor*, whilst pedicels and top of stem are glabrous.

The remaining British species, *A. alpestris*, Schmidt, belongs to the section *Subglabræ* and is, as one may imagine, much more glabrous than any of the others in stem, leaves, etc. Its distribution in Britain is more northern than *A. pratensis* or *A. minor*, but an isolated colony exists in Sussex.

A. acutidens, Lindb., was reported from Ben Lawers in Aug. 1911, on the occasion of the Phyto-Geographical Excursion. Last year he was in that neighbourhood and failed to see anything but *A. alpestris* on the mountain. Dr. Lindberg has now named the original plants of the 1911 gathering as autumnal states of *A. alpestris*, so it is believed true *acutidens*—of which an undoubted example from Russia is on the table—has yet to be found

in our Islands. It belongs to the *Subglabræ*, and is undoubtedly closely allied to *alpestris*.

The other non-British species are—under section *Hirsutæ*; *A. pastoralis*, Buser, leaves pilose above, pedicels glabrous; *A. micans*, Buser, with the veins on the under leaf-surface shining; *A. subcrenata*, Buser, leaves much less hairy above and teeth broad and obtuse; and *A. acutangula*, Buser, with long, more or less acute, leaf-lobes.

Under *Subglabræ*, comes *A. obtusa*, Buser, which is close to *acutidens* but has broader leaf-lobes and teeth, and sepals and episepals broader and shorter; and *A. glomerulans*, Buser, with flowers in somewhat close heads.

From the careful maps, prepared by Dr. Lindberg, showing the distribution of these various forms, it will be seen that Great Britain may yet claim some of them as true natives.

Mr. F. N. Williams, Mr. James Groves, and Dr. Otto Stapf engaged in a discussion, and Mr. C. E. Salmon replied.

Prof. DENDY, F.R.S., then gave a summary of his paper on the Calcareous Sponges collected in the Indian Ocean on the Percy Sladen Expedition under the leadership of Prof. J. Stanley Gardiner; he stated that of more than 400 species of *Calcarea* known, the present collection consisted of 13 species, several of which were new to science, a very satisfactory result, considering that the expedition was not primarily devoted to collecting close to the shores of the islands visited.

Prof. J. Stanley Gardiner added further remarks on the localities visited, and the range of some of the species, followed by a few additional remarks by the author.

A paper entitled “On *Embia major*, sp. nov., from the Himalayas,” by Dr. A. D. IMMS, F.L.S., was read in title, in the absence of the author.

The next paper, by Dr. J. D. F. GILCHRIST, on the larval stages of *Jasus lalandii* (Milne-Edwards), was read by Prof. G. C. Bourne, F.R.S., Sec.L.S., and commented on by the Rev. T. R. R. Stebbing (who showed specimens of the three stages), Dr. W. T. Calman, and Prof. Dendy.

The last paper, by Mr. R. S. BAGNALL, “On the Classification of the Order Symphyla,” was read in title, the author not being present.

April 17th, 1913.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 3rd April, 1913, were read and confirmed.

Mr. James Donald was proposed as a Fellow.

Mr. Charles Oldham, F.Z.S., and Mrs. Rose Haig Thomas, were elected Fellows.

The following Auditors for the Treasurer's Accounts were nominated by the Council, and elected by show of hands, namely : for the Council, Mr. Arthur W. Hill and Dr. W. G. Ridewood ; for the Fellows, Mr. John Hopkinson and Mr. Alfred W. Oke.

The first paper was by Mr. M. P. PRICE, M.A., and Mr. N. D. SIMPSON, B.A., F.R.M.S., who gave an Account of the Plants collected by Mr. M. P. Price on the Carruthers-Miller-Price Expedition through North-west Mongolia and Chinese Dzungaria. (Communicated by Dr. O. STAPF, F.R.S., Sec.L.S.) The paper was illustrated by lantern-slides, showing the character of the country traversed by the expedition.

Dr. Stapf and Dr. Rendle contributed further remarks upon the paper, and Mr. Price replied.

Mr. EDMUND G. BAKER then gave an account of some British varieties of the Bee-Orchis, *Ophrys apifera*, Huds. He stated that in the typical form of the Bee-Orchis the labellum is broadly convex, with a terminal, reflexed appendage, brown-purple, disk spotted with orange-yellow. In 1840 Hegetschweiler in 'Die Flora der Schweiz' described and figured *Ophrys Trollii*, a plant with the middle lobe of the labellum narrowly lanceolate, elongated, purplish-red in the centre, gold at the edge. The three outer perianth-lobes lanceolate-pointed. The plant came from Winterthur.

In this country there appear to be a series of intermediate forms connecting the typical form with *O. Trollii*, some being more nearly allied to the former, some to the latter. The plant from Reigate, which has been called *Trollii*, closely approximates to a figure in Reichenbach's 'Icones,' vol. xiv. t. 457, fig. 11., but it is not very like the plant of Hegetschweiler. The plant, on the other hand, figured by Mr. White in the 'Bristol Flora,' more closely approximates to the true *Trollii*. There is an interesting note in the 'Phytologist,' n. s. vol. v. p. 175, on some additions to an interleaved copy of Blackstone's 'Harefield Plants,' formerly belonging to Peter Collinson, stating that three roots of the Wasp-Orchis were found at Clifton in 1787, the lip being very narrow, yellow streaked with dark purple.

There are also plants from Oxford and Lewes which are intermediate between the Reigate plant and that from Bristol.

The President, Dr. Rendle, Dr. K. Domin (visitor), Mr. C. E. Salmon, and Dr. Stapf discussed certain points, and Mr. Baker replied.

The last paper was by Dr. HISAYOSHI TAKEDA (communicated by Dr. STAPF, F.R.S., Sec.L.S.), on the Flora of Shikotan.

Shikotan is the southernmost of the Kurile Islands, which are distributed in the form of a chain between Kamtschatka and Yezo, and lies between about $43^{\circ} 35'$ and $50'$ N. and $146^{\circ} 30'$ and $55'$ E. Its area does not perhaps exceed 140 sq. m. The island is hilly, and some of the hills are covered with forests of conifers and deciduous trees, others with dwarf bamboos—species of *Sasa*. There are many streams along which bogs and swamps are often well developed. The vegetation of this island has hardly been touched by human hands, but left in quite a primitive state.

Further remarks were made by Dr. Rendle and Dr. Stapf, and additional information was given by the author in his reply.

May 1st, 1913.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 17th April, 1913, were read and confirmed.

Mr. John Harrison, Miss Grace Bigby, B.Sc., and Mr. Cyril West, were admitted Fellows.

Mr. Leslie Frank Newman, M.A.(Cantab.), was proposed as a Fellow.

Mr. Robert Paulson, F.R.M.S., was elected a Fellow, and Professor Hermann von Vöchting, a Foreign Member.

The President announced that it had been decided to award the Linnean Medal to Professor ADOLF ENGLER, F.M.L.S.

Dr. W. G. Ridewood having stated his inability to act as Auditor, to which he had been elected at the previous meeting, Prof. Percy Groom was nominated in his stead, and by show of hands was elected Auditor.

The first paper, by Prof. PERCY GROOM, F.L.S., and Mr. W. RUSHTON, was entitled "The Structure of the Wood of East Indian species of *Pinus*," which was explained by Prof. Groom.

Dr. D. H. Scott and Mr. H. N. Ridley commented on the paper, and Prof. Groom replied.

Dr. WINIFRED BRENCHLEY gave an abstract of her paper "On branching specimens of *Lyginodendron oldhamium*, Will.", illustrating her remarks with lantern-slides and wax models.

Prof. F. W. Oliver and Dr. D. H. Scott contributed further details concerning these specimens.

Mr. A. C. F. MORGAN read his paper "On a Problem in Weismannism," and Miss E. N. Thomas, Mr. J. C. Shenstone, and Mr. H. N. Ridley added further remarks, which were acknowledged by the Author. (Abstract, p. 69.)

Mrs. L. J. WILSMORE's paper on *Sphenopus marsupialis*, communicated by Prof. J. P. HILL, was read in title.

The following seven papers, communicated by Prof. J. STANLEY GARDINER, were read in title; all have reference to the collections made by the Percy Sladen Expedition to the Indian Ocean:—

Miss HELEN L. M. PIXELL, B.Sc.—Polychæta of the Indian Ocean, with some Species from the Cape Verde Islands.—The Serpulidæ, with a Classification of the Genera *Hydroides* and *Eupomatus*.

Mr. S. HIRST.—Report on the Arachnida of the Seychelles.

Miss MARJORIE LINDSAY, B.Sc.—On *Gypsina plana*, Carter.

Mr. A. GROUVELLE.—Nitidulæ, Heterocidæ.

Mr. A. RAFFRAY.—Pselaphidæ de l'Archipel des Seychelles.

Dr. K. JORDAN.—Anthribidæ of the Seychelles.

Mr. S. MAULIK.—Hispinæ from the Seychelles.

The last paper, "On certain Changes in Nomenclature of Lepidoptera proposed by Dr. Verity," by Dr. K. JORDAN and communicated by the President, was also read in title.

May 24th, 1913.

Anniversary Meeting.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 1st May, 1913, were read and confirmed.

Mrs. Rose Haig Thomas and Mr. James Meikle Brown were admitted Fellows.

Mr. Charles Daley and Dr. George Blundell Longstaff, M.A. (Oxon.), D.M., were proposed as Fellows.

Sir ERNEST CLARKE exhibited by permission of the owner, 15 pages of MS. by Oliver Goldsmith (1728-1774), of the first section of his book relating to birds in his 'History of the Earth, or Animated Nature,' 1774.

These pages of manuscript once belonged to Dr. Thomas Percy, afterwards Bishop of Dromore (1729-1811), who was an intimate friend of Goldsmith, and collected materials shortly after the poet's death for a Memoir of him. Owing to disputes with the publishers, this Memoir was not published until 1801, as part of the 4 vols. of "Miscellaneous Works of Oliver Goldsmith, M.B.," and then without the Bishop's imprimatur: but the following passage from it is evidently of Percy's composition, and is no doubt based to some extent upon the MS. now shown:—

"His elegant and entertaining style in prose flowed from him with such facility that in whole quires of his histories, Animated Nature, &c., he had seldom occasion to correct or alter a single word." (Vol. i. p. 133.)

Cf. Dr. Johnson at the Dinner of the Literary Club, 30 April, 1773: "Sir, he [Goldsmith] has the art of compiling and of saying everything he has to say in a pleasing manner. He is now writing a Natural History, and he will make it as entertaining as a Persian Tale."

The Treasurer laid his Annual Statement of Accounts before the Meeting, and explained the various items of receipts and expenditure, and the same was received and adopted upon the motion of the President (see pp. 22-24).

The General Secretary then laid his Annual Report before the Meeting, thus:—

Since the last Anniversary 18 Fellows had died, or their deaths been ascertained:—

Benjamin James Austin.
Albert William Bateman-
Brown.
John Blaikie.
Sir Edmund Buckley.
The Rev. Robert Ashington
Bullen.
Frederick Merryweather
Burton.
James Charles Cox, M.D.
Herbert Druce.

The Rev. John Gerard, S.J.
Henry Groves.
William Thomas Hindmarsh.
John Hughes.
Allan Octavian Hume.
Frederick Halsey Janson.
William Forsell Kirby.
Lieut.-Col. John Scully.
Francis Gray Smart.
Sir Charles Whitehead, Kt.

Also 2 Foreign Members:—

Prof. Dr. Paul Friederich August Ascherson*.
Prof. Dr. Theodor Magnus Fries, K.N.O.

* Included since the reading of this report.

Fellows withdrawn (17):—

Mrs. Florence Baines.	The Rev. William Johnson.
Prof. Vernon Herbert Blackman.	Daniel Angell Jones.
William Eagle Clarke.	Lester Vallis Lester-Garland.
Edward Alfred Cockayne.	Prof. Alexander Meek.
Fiennes Stanley Wykeham	Sydney Gross Paine.
Cornwallis.	William Saunders.
Frederick Hamilton Davey.	Arthur George Tansley.
Thomas Fox.	Prof. D'Arcy Wentworth
Dr. Joseph Reynolds Green.	Thompson.
Norman Miller Johnson.	

Fellows whose names were removed from the List by order of the Council:—

Alan Fairfax Crossman.	George Whitfield Smith.
The Viscount Mountmorres.	

Fellows elected 35, of which 30 have qualified up to the present time; also 1 Foreign Member elected.

The Librarian's report was as follows:—

During the past year there have been received as donations from private individuals 97 volumes and 152 pamphlets.

From the various Universities, Academies, and Scientific Societies there have been received in exchange, and otherwise, 381 volumes and 63 detached parts, besides 93 volumes and 20 parts obtained in exchange, and as donations from the editors and proprietors of independent periodicals.

The Council at the recommendation of the Library Committee have sanctioned the purchase of 212 volumes and 33 parts of important works.

The total additions to the Library are therefore 783 volumes and 268 separate parts.

The number of books bound during the year is as follows:—
In full-morocco 3, in half-morocco 213, in half-calf 3, in full-cloth 324, in vellum 48 volumes, in buckram 45, in boards and half-cloth 21 volumes: relabelled (half-morocco and cloth back) 48. Total 705 volumes.

The General Secretary having read the Bye-Laws governing the elections, the President opened the business of the day, and the Fellows present proceeded to vote for the Council and Officers.

The Ballot for the Council having been closed, the President appointed Prof. Vines, Dr. D. H. Scott, and Mr. Sydney Turner,

TREASURER'S ACCOUNTS FOR THE YEAR ENDED APRIL 30TH, 1913.
(Presented at the Anniversary Meeting, May 24th, 1913.)

Receipts and Payments of the Linnean Society from May 1st, 1912, to April 30th, 1913.

General Account.

<i>Receipts.</i>		<i>Payments.</i>	
£	s. d.	£	s. d.
Balance at Bankers on 1st May, 1912.....	137 12 5	Taxes and Insurance	13 9 9
Interest on Investments	241 11 6	Repairs and Furniture	40 12 3
Admission Fees	216 0 0	Coal, Electric Current, and Gas	36 14 3
Annual Contributions	1626 0 0	Salaries	764 10 0
Compositions	258 0 0	Library:—	
		Books	£214 14 10
		Binding.....	123 4 4
		Arranging Linnean manuscripts	15 0 0
Sales of Publications:—			
Transactions	£145 13 2	Expenses of Publications:—	
Journals	87 3 0	Printing	£788 0 1
Proceedings and Catalogues	7 15 8	Illustrations	315 7 5
		Distribution	62 10 5
Sale of old Copper Plates	39 17 6	Miscellaneous Printing and Stationery	1165 17 11
Fellows' postal account, deposits	17 2 5	Petty Expenses (including Tea and Postage)	129 2 8
Donations in aid of Publications	276 13 4	Fellows' postal account	100 13 0
Miscellaneous Receipts	21 9 8	Linnean Medal	15 0 0
		Investment of Compositions	149 1 8
		Balance at Bankers, 30th April, 1913	
		(including £50 12 10, deposits, Fellows' postal account)	£305 0 2
		Cash in hand	1 17 10
			306 18 0
			£3074 18 8

Separate Account.

To Balances at Bankers, May 1st, 1912 :—		£	s.	d.
Westwood Fund	£13 15 1			
Trail Award Fund	7 11 0			
Crisp Award Fund	9 0 4			
Taggart Fund	1 16 0			
Donation from Sir Frank Crisp, Bart. (Crisp Award Fund)		32	2	5
Contributions towards Publication of Schulze's 'Nomenclator Animalium'		24	14	8
Legacy from the late Sir Joseph Hooker. £100 0 0		88	15	6
Contributions to the Hooker Lecture Fund	175 8 0			
Linnean Dinner Receipts		275	8	0
		41	14	0
Interest on Investments :—				
Westwood Fund	£6 19 4			
Trail Award Fund	3 10 0			
Crisp Award Fund	6 8 2			
Taggart Fund	17 9 4			
Hooker Lecture Fund	3 8 10			
		37	15	8
		£500	10	3

Investments on April 30th, 1913.

General Account.

General Account.							
	£	s.	d.		£	s.	d.
Metropolitan Consolidated 3½ per cent. Stock	1150	0	0	@ 99	1138	10	0
Great Indian Peninsular Railway, Annuity Class B.....	42	1	5	@ 20½	867	14	4
North Bridge Railway 4 per cent. Stock	450	0	0	@ 101	454	10	0
Metropolitan Consolidated 3 per cent. Stock.....	1000	0	0	@ 87½	875	0	0
India 3 per cent. Stock.....	1075	0	0	@ 76	817	0	0
Eastern Bengal Railway 4 per cent. Debenture Stock	1000	0	0	@ 97	970	0	0
Great Western Railway 4 per cent. Debenture Stock	1000	0	0	@ 104	1040	0	0
Midland Railway 2½ per cent. Preference Stock	300	0	0	@ 63½	189	15	0
					£6352	9	4

Separate Account.

Separate accounts.							
	£	s.	d.		£	s.	d.
Metropolitan Water Board 3 per cent. "B" Stock (Westwood Fund)	232	5	0	78	232	5	0
Ditto (Hooker Fund)	350	0	0	78	350	0	0
New South Wales 3½ per cent. Stock (Trail Award Fund)	100	0	0	89½	100	0	0
2½ per cent. Consolidated Stock (Crisp Award Fund)	252	18	0	74½	252	18	0
East Indian Railway 3½ per cent. Debenture Stock (Tagart Fund)	530	0	0	89½	530	0	0
	£1206	14	7		£1206	14	7

HORACE W. MONCKTON, *Treasurer.*

We have (in conjunction with the Professional Auditor, who certifies as to all details) audited the Accounts of the Society for the year ended 30th April, 1913, and found them correct.

Dated this 16th May, 1913.

W. B. KEEN, *Chartered Accountant.*

ARTHUR W. HILL,
OTTO STAFF,
PERCY GROOM,
JOHN HOPKINSON,
ALFRED W. OKE,

Auditors.

Scrutineers; these having examined the Ballot-papers and cast up the votes, reported to the President, who declared the result as follows:—

Prof. G. C. BOURNE, F.R.S.; Dr. W. T. CALMAN; Sir FRANK CRISP, Bart.; Prof. PERCY GROOM, D.Sc.; Prof. W. A. HERDMAN, F.R.S.; ARTHUR W. HILL, M.A.; Dr. B. DAYDON JACKSON; Prof. F. KEEBLE, Sc.D.; Prof. E. A. MINCHIN, F.R.S.; HORACE W. MONCKTON, F.G.S.; Prof. FRANCIS W. OLIVER, F.R.S.; Prof. E. B. POULTON, F.R.S.; Dr. A. B. RENDLE, F.R.S.; Dr. WALTER GEORGE RIDWOOD; Miss EDITH R. SAUNDERS; Prof. A. C. SEWARD, F.R.S.; Dr. OTTO STAPF, F.R.S.; Miss ETHEL N. THOMAS, B.Sc.; Comr. J. J. WALKER, R.N.; Dr. A. SMITH WOODWARD, F.R.S.

(The retiring Councillors were Dr. TEMPEST ANDERSON, Prof. A. DENDY, F.R.S., Prof. J. STANLEY GARDINER, F.R.S., Mr. H. N. RIDLEY, F.R.S., and Dr. D. H. SCOTT, F.R.S.)

The Ballot for the Officers having closed, the President appointed the same Scrutineers, who having examined the Ballot-papers and cast up the votes, reported to the President, who declared the result as follows:—

President: Prof. E. B. POULTON, F.R.S.

Treasurer: HORACE W. MONCKTON, F.G.S.

Secretaries: Dr. B. DAYDON JACKSON.

Dr. OTTO STAPF, F.R.S.

Prof. G. C. BOURNE, F.R.S.

The President then delivered his Address entitled, A remarkable American work upon Evolution and the Germ Theory of Disease, as follows:—

PRESIDENTIAL ADDRESS, 1913.

ABOUT two months ago when I was thinking over various possible subjects for this address, there arrived by post—just at the psychological moment—an American pamphlet, sent by my friend, our illustrious Fellow, Dr. Alfred Russel Wallace. Accompanying the pamphlet was the following very kind letter, referring to James Cowles Prichard's* anticipation of modern views on evolution.

Old Orchard,
Broadstone,
Dorset.
April 2, 1913.

My dear POULTON,

About two months ago an American sent me the enclosed booklet, which he had been told was very rare and contained an anticipation of Darwinism.

This it certainly does, but the writer was highly imaginative, and, like all the other anticipators of Darwin, did not perceive the whole scope of his idea.

His anticipation, however, of diverging lines of descent from a common ancestor and of the transmission of disease germs by means of insects, are perfectly clear and very striking.

As you yourself made known one of the anticipators of Darwin, whom he himself had overlooked, you are the right person to make this known in any way you think proper. As you have so recently been in America, you might perhaps ascertain from the Librarian of the Public Library in Boston or from some of your biological friends there what is known of the writer and of his subsequent history.

If the house at Down is ever dedicated to Darwin's memory, it would seem best to preserve this little book there; if not you can dispose of it as you think best.

With best wishes,

Yours very truly,

ALFRED R. WALLACE.

Referring to the last paragraph, Dr. Wallace now agrees with me that the library of the Linnean Society is the most appropriate place for the work.

The booklet had been sent, on Feb. 6, 1913, as a kind of 90th birthday present to Dr. Wallace, by Mr. B. R. Miller, an American gentleman who has always taken a lively interest in the subject of evolution. In a later letter, dated May 12, Mr. Miller writes to me:—"I remember the bookseller I bought it of saying that it

* Poulton's *Essays on Evolution*, Oxford, 1898, p. 173. Prichard's anticipation was discovered by the late Dr. Maurice Davis, J.P.

was an old work and had been through many hands; this was in a Mr. W. Davie's book store in either Cleveland or Cincinnati,—one or the other Ohio town, in 1891 or 1892."

The pamphlet, which appeared to be very old, although in an excellent state of preservation, bore the following words on both cover and title-page.

SHALL WE HAVE COMMON SENSE

SOME

RECENT LECTURES

WRITTEN AND DELIVERED BY

GEO. W. SLEEPER.

BOSTON:

WM. BENSE, PRINTER.

1849.

The contents entirely bore out Dr. Wallace's words. Supposing the work to be genuine, I doubt whether so much of pregnant thought and penetrating imagination has ever before been recorded in so small a compass. The pamphlet measures 4 inches in width by just under $5\frac{1}{2}$ in height, the printed surface of 32 out of the 36 pages measures $2\frac{5}{8}$ inches by $4\frac{3}{8}$.

The remaining 4, being first and last pages, hold fewer lines of print. The type is far from small and spaced so that a complete page holds 27 lines.

The pamphlet contains a brief introduction, not included in the 36 pages referred to above, and two lectures stated to have been delivered in Boston in 1847,—“The Origin of Life and the advance of civilization,” and “The Dangers of the Unseen.”

Within a space thus limited, the ideas in the following pages are propounded. The author's words, except in the concluding paragraph of the booklet, are quoted without comment, but I have printed in italics at the head of each section the various subjects with which he deals. I have also inserted a few words in square brackets and added one or two footnotes in order to show the relationship between some of the author's sentences or to make some brief explanation.

LECTURE I.

THE ORIGIN OF LIFE

AND THE ADVANCE OF CIVILIZATION.

- i. *The Origin of Life in minute particles scattered through space—a view similar to that brought forward by Arrhenius in 1906.*

“..... Life owes its faint beginning to primal germs. These germs I hold to be infinitesimally minute living atoms pervading the entire terrestrial atmosphere; and, perhaps, the entity of the Cosmos.

“Perishable themselves, each is the common carrier of the principle of Life which is indestructible and eternal,” (p. 3.)

- ii. *Natural Selection.*

“Arranging themselves in strict obedience to dominant Natural laws of which we have but little knowledge, in a vastness of Space of which we have no intelligent conception, and exhibiting an almost unmeasurable minuteness reducing our feeble powers of comprehension to appalled nothingness, these germs are slowly developed, altered and perfected during an immensity of periods of time compared to which the six thousand years of the Bible is but a trifling era—a pebble on the sea shore; a tiny star in the Milky Way.

“These germs of life and the individuals growing out of them, were constantly experiencing change. Weakened by exposure and attack they were only preserved unmodified for a brief (though variable) period by means of the more or less effectual resistance they were able to offer to climatic

conditions, changes of food, convulsions and transformations of Nature and the destructive inroads of overpoweringly hostile forms of reptile, piscine or animal Life.” (p. 4.)

“Primal matter to zoophyte, to crustacean, to fish, to saurian, to mammal and to Man! the inferior forms disappearing when their allotted work was done and the improved era no longer warranted their then inutile existence just as the platysoma of the Old Red Sandstone vanished in the Magnesian Limestone; or else becoming dwarfingly modified previous to extinction: similarly to the diminution of the seventy foot iguanodon into the four foot and perishing iguana which has outlived the age and environment which called its giant ancestor into being.

“In this ever recurring disappearance, or modification, of animal and vegetable forms there is nothing strange. Everywhere about us we see waged the pitiless battle for life of which it is the inevitable outcome. Just as the dandelion, the plantain and the burdock extend their broad leaves o’er the verdure of the meadow, starving and exhausting the grasses around them; so there is a continual process of elimination and substitution going on in the great laboratories of Nature; the useless perish, the useful live and improve, although our conception of what is useful and improving is often opposed to Nature’s.

“All Geology indicates assured progress by its presentation of higher and higher generations of exalting forms, each remarkably suited to the peculiar age in which it appeared at its best” (pp. 8-10.)

iii. *Recapitulation.*

“The wonderful progressive presentation of forms ascending from day to day in the scale of organized beings exhibited by our species in the foetal state and remarked by the physiologist, is another substantiation of my theory.

“Man, in the womb, passes through all the embryo forms of the types of the known divisions of animated Nature: first but a germ, he then resembles mollusk, fish, reptile, bird, rodent, ruminant, and batrach*, finally assuming unmistakable features of the human animal. Thus we see a significant panorama of the momentous changes which occurred in the course of ages displayed in the short space of nine months in the mysterious womb.” (p. 8.)

* Evidently a printer’s error for “batrach” and referring to a fanciful resemblance of the foetal face to that of a frog.

- iv. *The antiquity and origin of Man: his development, not from the Anthropoids directly, but, on diverging lines, from an ancient common ancestor.*

"..... And it is also fabled that all this work of Creation occurred but six thousand years ago! Which Creation, the state of civilization in India and China some five thousand years back, is sufficient to disprove without the abundant aid derived from Geological evidence; all proving an inconceivably ancient history for Man." (p. 2.)

"..... Man and the Ape are co-descended from some primary type," (p. 6.)

Remembering "that it is not to the higher evolutions of Man nor to the lower * variations of the Monkey that we must look in this matter, but to just the reverse of each." The lecture continues "And then in many respects a striking parallel is observed to exist between the 'lord of creation' and his Quadrumana relatives the Chimpanzee and the Ourang Otang which clearly establishes the extremely rational view I have advanced and enables us to experience very little difficulty in tracing back these kindred creatures to a remote, an ancient, but a general stock; although exactly what that common forefather was is as likely to forever remain as profound a mystery as the astounding problem of how the beginning of things could take place or the absolute ending of all matter can ever occur!

"We have never found any living or fossil link to form a chain between Man and the Ape, nothing to close the gap separating the two related animals like Owen's rhynchosaurus bonds the avines to the saurians, and the pliosaurus unites the pterodactyle to the crocodile. I doubt that any such creature will be discovered; to my mind there never was occasion for its existence: more likely some relic of an, at present, unknown animal proving to be the forerunner of both species, will be exhumed out of the debris of an age immediately antecedent to both:" (pp. 6-8.)

"I feel assured that skeletons or rock-preserved hairy specimens of this ancestor of the two species will ultimately be excavated from the strata preceding that in which remains of Man and of the Monkey have been found," The greater perishability and much more restricted production and distribution of the human frame in those remote ages,

* This and the preceding five words are so faintly printed as to be almost unrecognisable, but it is believed that the reading adopted above is correct. [Since confirmed by reference to a more clearly printed copy kindly lent by Mr. J. F. Sleeper.—E. B. P. Aug. 12, 1913.]

together with the very limited extent of the exploration of this but recently thrown open field have so far precluded success." (p. 11.)

v. *The germinal origin of characters, and the persistence of germ-life.*

"But our parallel of comparison of Man with the Simians is effectually arrested by a threefold, irremovable, barrier: the possession of progressive, deductive and inventive Reason; the acquirement of extensible and transmissible Speech; and the innate knowledge of the formation and use of Tools; attributes resident solely in the spermatozoa and ovum of the human species, and absolutely inseparable therefrom. So I am spared the unpleasantness of announcing anything so distasteful, to you, as that the monkey was parent or progeny of Man; thus, this Scylla and Charybdis being happily steered past, I merely find it necessary to reaffirm my fixed belief in the gradual origination of both from a general parent, each distinct from birth and each preserving that distinctiveness unto the present epoch, modified somewhat, it is true, in the instance of the human individual owing to his germ-endowment with the rudiments of primarily cultivatable and incalculably higher functions." (pp. 10-11.)

"Spiritualism plays no part in the great drama of this our life. Indeed, the sole phenomenon approaching to such is the departure of the life-germ from a perishing frame but to begin anew in another or an allied form. For nothing is lost in the vast economy of Nature: all things suffer but a transient change of form: thus the life germ resident in Man transmitted to his descendants, goes on existing indefinitely throughout all Time's infinitude of years; just as his Thoughts, those Genii children of his prolific brain, continue to live on ages and ages after that transitory organ has mouldered away into the dust of the long ago; and thus, and only thus, is Man immortal: in the transmission of his germ life and in the eternal perpetuation of his Original Thought." (p. 14.)

LECTURE II.

THE DANGERS OF THE UNSEEN.

vi. *The germ-theory of disease.*

"From observation, thought and deduction, I have concluded that earth, air and water are replete with multitudinous, infinitesimal, ever active creatures, probably many

of which are too minute for our best microscopes to reveal to the sense of sight. These pigmy, insignificant-seeming and yet collectively formidable beings are everywhere at work—born in myriad numbers, propagating and expiring in a brief season, like May-Flies, e'er they hardly have begun to live; they infect or disinfect the air, alter the nature of the soil, and cleanse or contaminate the water. Entering our systems through all of these facile mediums (we inhale on an average about 2800 cubic feet of air through our lungs in the short space of only twenty four hours and swallow dust and water in surprising quantities every day of our lives) they soon obtain mastery over our weakened bodies and it is surely their malefiant effects that we behold in the horrid virulence of small-pox, the dreadful malignancy of cancer and the melancholy ravages of consumption. Kings evil, catarrh, malarial and scarlet fever, measles, the putrid sore throat, gangrene, aye, dozens of other catching ails let loose from a cursed Pandora's box among humankind, are simply the direct or indirect results of these almost invisible atoms.

"The drop of water we sip, the breath of air we breathe, the particle of dust that finds insidious entrance to our bodies, may be to us the unseen precursor of terrible disease, the unheard knell of fateful doom, the silent forerunner of early, torturing, ghastly death." (pp. 24-25.)

" May not soils owe their fertility or sterility, their adaptability or impracticability to the unseen workings of these Genii of the Little? May not water, also, derive many of its properties, beneficial or injurious as they may happen to be, from its teeming contents of microscopical life? We already know (from Bruce, the traveller,) that the natives of far away Abyssinia are infested with parasite Worms through the agency of the water they drink—may not many diseases of the guts originate from germs more minute than these pernicious Larvæ?" (p. 35.)

vii. *Spontaneous generation.*

"I have repeated most of these interesting experiments [of Spallanzani and Schwann] and in addition to these have made many more of my own devising.

"From them I find that Schwann is, in the main, correct; but further note that the close sealing he has recourse to is unnecessary, merely stuffing the mouth of the containing vessel with cotton wool will answer the same purpose; that of a germ barrier, as the most elaborate sealing if the heated wool is held in a forceps.

"A hood dipping into quicksilver answers excellently. Yet mere filtration is inadequate.

"I am now certain that this much talked of spontaneous generation is largely a delusion and that if the phenomenon ever does take place it is only exhibited under extremely unusual conditions and in most extraordinary cases."
(pp. 27-28.)

viii. *Cultivation from a diphtheritic throat.*

"I have placed some of the matter containing certain of what I have found, to be the minute beings causing the putrid sore throat in the common calves foot jelly so familiar to all of you and covered this with a bell jar standing in quicksilver ; jelly, jar and metal all being strongly heated—thus, as you can readily understand, completely excluding any other germs. In three days, these particular germs had amazingly multiplied as rounded jointed grains in wavy clusters, and each little portion of the jelly when placed in pieces of fresh jelly was capable of plentifully propagating them in the new material which, in turn, produced them in others—and so on.

"I was curious to see how they would adapt themselves to human blood : to avoid the red color I let some venous stand quietly, having skimmed off some crust ; and drew away the greenish yellow watery serum from the cruor and heated it for some hours to 140° of Fahrenheit which I have found sufficient to destroy germ life. In this the beings appeared in only thirty hours ! and were larger, fibrous and moist. Other children in the same house with the boy from whose throat I obtained the matter, yielded none of the peculiar germs referred to—until some acquired the same disease, these then exhibited the noxious organisms in his or her greyish throat matter." (pp. 28-29.)

ix. *Contagion.*

"Reflection on this [the statements in the two paragraphs last quoted], leads us to consider how many diseases may be introduced, transmitted or conveyed by the contact of flesh, perspiration or saliva and how cautious, how prudent and how circumspect we should ever be in governing the intercourse of ourselves and of our children with other persons or creatures, no matter whether the latter appear to be clean and healthy or not.*" (pp. 29-30.)

* Continues with "If the system is in proper condition", on p. 34.

x. *Resistance : Suggestions of phagocytes.*

"Only nearly perfect, very healthy, vigorous bodies can successfully resist these parasitic wanderers, (Ishmael-like roamers through the universe) when they are at their best and we are exposed to their attacks: hence we note a favored few who defy plague and pox and cholera; epidemics of all fateful kinds and remain serene, incautious and unscathed. But wo to the weak, the ailing or the debauched! they fall an easy prey to the fatal onslaughts of these tiny destroyers, everywhere watchful, voracious, insatiate; even as the Harpies of fable or the vulture that preyed on Prometheus [sic]. Why this is so, I am unable to say; it is doubtless for the same reason that a stunted, set back, or sickly plant yields to the massed attacks of aphide hosts while healthier close by vegetation of the same kind is nearly free from the vermin destroying the weaker foliage: from what either results, our too scanty store of knowledge avails us not to tell. It may be that, precisely as the spermatozoa, which Leeuwenhoek in 1677 discovered existing in the bodies of men; so other living germs, antagonistic to the evil kinds, may oppose the latter in undebilitated systems and wage war upon the humors in our blood." (pp. 25-26.)

"..... If the system is in proper condition one will go as safely through any contagion as a diver in Halley's suit through the water of the sea, but who is so wise as to know when he is absolutely hale and hearty? one fatal moment of inviting weakness, and wo! the insidious germ has found a foothold.

"Then comes the difficulty of dislodgment. These creatures floating numerous through the entire atmosphere and only able to thrive in a congenial harbourage: just as the Tobacco Worm can subsist but on the foliage of the plant from which it receives its name—once having effected this subtle lodgment in our systems, are there protected by phlegmatic or viscid excretions partly emanating, perhaps, from their own organisms and partly consisting of corruption thrown out by the irritated tissues for the purpose of resisting the invasion: as observed in putrid sore throat and in catarrh; and then withstand many substances that otherwise would immediately kill them.

"Do not misunderstand me: I do not mean to say that all diseases are thus contracted, but only those that are similar to those I have mentioned. Nor do I assert that the

observance of all the precautions hinted at, will ward off all danger. * ” (pp. 30-31.)

“ We have an approach to something of the kind in Jenner’s valuable vaccine for the prevention of Small-pox. Here, I believe, is shown a striking instance of the destruction of one germ by another : the substance he employs must contain creatures antagonistical to those of the Small pox pustules, else how could its effects endure so long in the systems of those inoculated with it ? And that this, supplied in sufficient quantities, not only overwhelms those of the malady when they enter the blood, but continues to exist, inhabit and breed in that fluid thereby preventing entrance of the other and fatal germ life. If this is so, then what a Sun of Hope—Hope that should ‘ Spring eternal in the human breast ’ bursts in dazzling splendour on afflicted Man : consumption, cancer, cholera, all must mitigate, recede, or vanish before beneficent germs meeting the horrible, destructive causes on their own grim ground and remaining triumphant on the never again to be fought-for field. ” (pp. 33-34.)

xi. *Insects as carriers of disease : Malaria and the mosquito : the House-fly.*

“ Careful observation has led me to perceive that many of our common insects are conveyers of the germs of illness, disease and death. The House-Fly that crawls over our food or drowns itself in our drink, the Gnat that buries its lancet in our veins, the Bed-Bug that attacks the uncleanly during the slumbers of night, the Wasp and the Bee that thrust us with their stings—are all transporters, injectors or introducers of germ life.

“ My reasons for affirming this are briefly comprised in the statement that I have never known a person to suffer from malarial fever that had not at one time or other been stung by Gnats or been the resident of a region containing these pests ; and that anyone can appreciate the too palpable filthiness of the Fly, feeding, crawling, rioting and breeding in the loathsome repulsiveness of refuse, offal, and decaying abominations of every conceivable kind ; then alighting on our victuals or on our persons to trail his defilement over our absorptive epidermis ” (pp. 31-32.)

* Continues with “ Careful observation has led me to perceive ”, &c., below.

xii. *The exclusion of house-flies : the utilization of natural enemies.*

"I suggest that wooden frames be covered with metal gauze such as is used for sieves, and hinged on outside of doors and windows, otherwise, with free access to your houses, what can be safe from the Fly? How to accomplish this [the extermination of the Fly], and also annihilate the swarms of Ticks, Fleas, Gnats, Bed-Bugs and so forth, is indeed a question. Of course cleanliness will affect something towards the desired end; but, perhaps, more than this may be called into play: maybe other creatures can be bred that may abate the numbers of these vermin, just as the Mungoos is used by the Hindu to destroy the Cobra-di-Capello, as the Ferret is set upon the Rat in England and the Ladybird is said to be employed in the South of Europe to exterminate the larvæ of various insects that prey on the poor peasant's scanty crops" (pp. 32-33.)

The author brings his second lecture to a close in a paragraph which obliterated 40 years and made me a boy again, reading Herbert Spencer's 'Principles of Biology' for the first time.

"All this", he is alluding to his germ theory and its possibilities, "I believe will be proven to be fact, and in its darker aspect we are very naturally brought to see no hand of God. For what just, compassionate and merciful Father Diety would let loose a host of death dealing, ravenous Wolves in miniature, upon ignorant, frail, sup-plicating creatures of his kindly creation—his own, fore known, fore-destined, children?" (pp. 35-36.)

Similarly, Herbert Spencer, after describing the adaptations by which a number of parasites are enabled to wage successful war upon mankind, continues:—

"What shall we say to this arrangement? Shall we say that man, 'the head and crown of things,' was provided as a habitat for these parasites? Or shall we say that these degraded creatures, incapable of thought or enjoyment, were created that they might cause unhappiness to man? One or other of these alternatives must be chosen by those who contend that every kind of organism was separately devised by the Creator." ('Principles of Biology,' London, 1864, vol. i. pp. 343-4.)

Herbert Spencer finds the answer to his question by invoking evolution and the struggle for life as its motive cause:—

“Slowly, but surely, evolution brings about an increasing amount of happiness: all evils being but incidental. By its essential nature, the process must everywhere produce greater fitness to the conditions of existence; be they what they may The universal and necessary tendency towards supremacy and multiplication of the best, applying to the organic creation as a whole as well as to each species, is ever diminishing the damage done—tends ever to maintain those most superior organisms which, in one way or other, escape the invasions of the inferior, and so tends to produce a type less liable to the invasions of the inferior. Thus the evils accompanying evolution are ever being self-eliminated. Though there may arise the question—Why could they not have been avoided? there does not arise the question—Why were they deliberately inflicted? Whatever may be thought of them, it is clear that they do not imply gratuitous malevolence.” (*ibid.* pp. 354–5.)

The author of this remarkable pamphlet takes different ground in seeking for his answer. Many will think—in spite of the narrow and aggressive spirit which disfigures the passage,—that he takes higher ground. In the attacks of the germs of disease upon man he sees no hand of God, but—

“ rather the astonishing, strange uncomprehended workings of some mightier power in almighty Nature infinitely beyond the weak, puny, priest aborted rudiments of perception, dawning in the infant brain of Man: carrying out a grand design of unfathomable profundity, in which an atom is as mighty as a mass, a second as significant as a thousand years, and the smallest being in the universe of as much importance in the stupendous scheme as lordly Man, himself, with all his presumption, arrogance and self conceit thick upon him—leading us to exclaim with Hamlet, in immortal Shakespeare:

‘There are more things in Heaven and Earth, Horatio,
Than are dreamt of in thy philosophy!’”

(p. 36.)

I do not propose, on the present occasion, to discuss the history of the ideas which have been quoted from the booklet. Any such consideration is better deferred until the authenticity of the date has been tested by every possible means. It is, however, appropriate to say at once, concerning what is perhaps the most

surprising statement in the work, that it supplies no evidence that the bacillus of Diphtheria had been seen by the author. My friend Dr. F. W. Andrewes of St. Bartholomew's Hospital wrote to me May 17 & 19, 1913:—

"I should regard the term 'rounded, jointed grains in wavy clusters' as a bad description of the bacillus of Diphtheria. On the other hand the phrase would be quite apt in describing the clusters of Streptococci which would commonly be present in sore throats or even in Diphtheria itself, and the appearance is one which might be visible with an inferior microscope. I think it would be correct to say that, *by crude methods*, clumps of Streptococci would be more readily recognized in sore throats than in normal throats. The microscopist can get from a sore throat something tangible to look at, and, in most sore throats, of whatever nature, he would be likely to see clusters of Streptococci."

A curious point about the first lecture is the very inadequate criticism of Lamarck whose theory is described as founded "entirely on Spontaneous Generation" (p. 18). The same is also true of the treatment of the "Vestiges of the Natural History of Creation" (1844) alluded to in the first lecture (1847) as having "appeared about three years ago" (p. 19).

The defence of phrenology (pp. 17-18) is consistent with the date assigned to the lectures; although, from information lately received, there is no doubt that the author retained his convictions on this subject unshaken up to the end of his life.

There are curious spellings some of which are obvious misprints. Beneficent in the form of "benificent" cannot be thus explained, for it appears three times (pp. 13, 19, 34).

LIFE OF THE AUTHOR.

I am now able to give a brief account of the life of the author, received only on the morning of May 20th from his son Mr. John F. Sleeper, of Tenafly, New Jersey. The information, partly conveyed in a letter and partly in newspaper cuttings, was the outcome of letters written to four American gentlemen bearing the name Sleeper whose addresses had been given to me by Mr. B. R. Miller.

George Washington Sleeper was born in Baltimore on Oct. 15, 1826. He went to Boston as a lad and eventually opened a great tea store there and later in Providence. He was prosperous in business until he was ruined by the Civil War and by the unpopularity of views which he never hesitated to express. The dates of his residence in Boston and Providence are given in Dr. Putnam's quotations on pp. 41, 42 from the Boston and Providence directories. After leaving Providence he went to New York, residing in Jersey City, N.J., where he died on Sept. 13, 1903. He was able to recover in a measure from his misfortunes, at one time selling books, at another travelling for a New York firm. He married in 1858 and a son, Mr. John F. Sleeper, was born in 1864.

His son's letter, dated May 10, 1913, gives a graphic picture of the persecution suffered by G. W. Sleeper. His outspoken views,—prominent in the booklet which is the subject of the present address—"drew down upon him the wrath of 'the bigots of his iron time.' Undismayed, he defied them all. Clergy—government—society—relatives—all! His friends shrank away (not even his *relations* could understand him; they declared him a lunatic), his enemies prevailed, he was mobbed and assaulted in the streets and halls, his bosom friend, Hilton, pulled his beard in public, his lectures were suppressed: all that frantic malignity could do to obliterate his written and spoken thought was resorted to." These statements are supported by the preface to the booklet quoted below and on page 42. At the same time it is only fair to remember that the language of the lectures was highly provocative and aggressive, and would have been likely to produce a remarkable effect upon hearers in the middle of the last century, and indeed in much later years. The preface to a later lecture "Education and its Offspring Civilization" (Providence, 1860) speaks of the alteration of notices and attempts to efface records so as make it appear that it was never given before the "Franklin Lyceum" of Providence. The appendix to the same lecture reproduces minutes and press notices in order to prove the fact of its delivery. Apart from the far greater detail given in the later pamphlet there is a striking similarity in the description of the conditions under which both were written. In both, the expressed object of the writer is to print addresses which neither audience nor Press would receive.

THE AUTHENTICITY OF G. W. SLEEPER'S PAMPHLET (1849).

The author's conclusions on a number of extremely important subjects have been given in his own words in the first part of this address. If it be true that these conclusions were reached by 1849, the fact is of the highest interest in the history of scientific thought. The author claims indeed that his ideas were older still by several years, for he says in the introduction—

"The original ideas on which these lectures were founded, entered my mind when I was barely seventeen, and during their gradual development the major portion of both of the lectures were committed to paper in the course of the past six years. The first public delivery of either occurred in Boston about two years ago,"

The above statement is consistent with the history of G. W. Sleeper, who was born on Oct. 15, 1826, and would therefore have been seventeen in 1843, six years before the date printed on the pamphlet. In 1847 he would have been twenty-one—a *very* early age, it must be admitted, for the amount of thought and reading implied by the two lectures.

Science is rightly exacting of proof when she is called upon to revise her history ; and it now becomes our duty to enquire, and if possible to decide, whether these statements are true,—whether the pamphlet was printed in 1849 or at some later date. It may be admitted at once that the general appearance of the work—the paper, type and style of printing—is entirely in its favour. This is the opinion of many eminent authorities who have kindly examined it for me—of Sir Frederick Kenyon and his staff at the British Museum Library, of Mr. Madan, Bodley's Librarian, and of Sir James Murray.

The Paper.—I have submitted photographs of the watermark to Mr. Lewis Evans, who kindly wrote May 2, 1913:—

"I have been looking through two collections of watermarks that I have but can find nothing conclusive in them. I have two small undated pieces of paper of which I enclose a tracing very like the mark in the pamphlet, they are hand-made, either English or Dutch, and I should think between 1790–1850: the VI or more probably I.V is not an uncommon mark, but whether it stands for 6, 4 or I. Van—I do not know. The pamphlet paper is I fancy Dutch and I think it would be made before 1849, but I do not know how far Dutch paper was in general use in U.S.A. about that date. The shield with 3 lines across it is fairly common in Dutch papers."

Mr. G. A. James Rothney also kindly wrote from John Dickinson & Co., London, April 30, 1913:—

"We have found a letter from the East India House, Leadenhall St., dated 5th Oct. '55, which has a watermark identical with the size mark, but it has no Roman lettering IV.

Mr. Johns—our great paper expert—rather fancies it is a Dutch handmade."

The Type.—Mr. Horace Hart, controller of the Oxford University Press, has kindly examined the type for me. The words "Some Recent Lectures" on the title-page and cover are almost identical with a line of "two-line Small Pica ornamented Latin" in a trade catalogue issued by the late firm of V. & J. Figgins. The catalogue was undated, but an order form with the decade "188—" was bound into it. "The Origin of Life" (p. 1) and "The Dangers of the Unseen" (p. 20) are almost identical with "two-line Brevier Monastic No. 2" in the same catalogue. It is certain that this type in the pamphlet was copied from that of Messrs. Figgins or *vice versa*. I applied to R. H. Stevens & Co., successors to V. & J. Figgins, but was unable to learn the date. Messrs. Stevens wrote Apr. 22, 1913:—"The two Faces that you mention are quite old and out-of-date, and we have no record of the date when they were first made."

Mr. Hart has written to me, May 23, 1913, on the questions raised in the preceding paragraph:—"I think you may take it as conclusive that the American founder would follow the English founder and not the other way about. You may also take it for granted that the typesetting firms would continue issuing their

old types for a great many years. It is a question of fashion rather than anything else. The types that you are interested in have gone out of fashion, and that is the reason why they do not appear in the typefounders' specimen books to-day. There are, of course, people who have made a study of types and their dates; but it happens that the types we have been discussing, are what are called Jobbing or Display types, used for circulars and advertisements; and no one is particularly interested in them.

"My opinion about the little booklet which you showed to me is, that it was not only set up, but was also printed off, and done up, *i. e.* stitched and put into its cover, by an amateur printer, and not by a regular printer. And it might very well have been printed in Boston at the date mentioned."

Mr. Hart also told me when I showed him the pamphlet a few weeks ago that the paper had not been damped, and that this and the setting-up, inking, and black marks made by the "furniture" showed that the work had not been done by a printer, but by an amateur who had access to a press of fair size. In all these respects the pamphlet presents an appearance remarkably different from the author's lecture, "Shall we have Free Speech?" undoubtedly printed in 1860—only eleven years later.

It is perhaps worth recording that the two titles appear to have been set up from a very small stock. The Brevier Monastic "i" is without a dot, but this feature is only wanting from the two letters in "Origin": the "i" in "Life" has been printed from a letter of another fount turned upside down, so that the dot is below the line.

INTERNAL EVIDENCE.

Registration and Press notices.—The first and most important line of evidence breaks down. The following words are printed on the back of the title-page: "Entered according to Act of Congress, in the year 1849, by Geo. W. Sleeper, in the Clerk's office of the District Court of Massachusetts." My friend Prof. C. S. Minot of the Harvard University Medical School has kindly written for me to Dr. H. Putnam of the Library of Congress, Washington, who states, Apr. 30, 1913:—"The Register of Copyrights reports that the copyright records for Massachusetts for the year 1849 are in his office and have been examined page by page, without discovering the registration of this work." Prof. Minot, however, writes, May 9, 1913:—"The record of copyrights begins with 1846, and I understand that the records for a few years are considered not to be perfect, so that there is a possibility of Sleeper's pamphlet having been issued and copyrighted, as stated on its title-page. It is, however, extremely improbable that such was the case." Further evidence by Dr. Putnam is more positive:—"We find the names of both the author and printer in the Boston directory for 1849. Sleeper's name also appears in the Boston directory from 1849–1855 inclusive; then in the Providence directory from 1856–1865,

in both places his occupation is given as a tea merchant. His name again appears in the Boston directory from 1866-1872*. Here he is listed as a printer. From the above it appears that the author and printer of the pamphlet lived in Boston at the time of the publication of it, thus affording evidence of its genuineness. The only negative testimony is that the copyright records of Massachusetts for 1849, which are in the custody of the Register of Copyrights, fail to show that the book was copyrighted as claimed."

The statement of registration is in favour of the authenticity of the work; for it is unlikely that one who was forging a date would print a conspicuous paragraph by which the forgery could be so easily detected.

The attempt to find evidence in the Press of the delivery of the lectures in 1847 or the publication of the work in 1849 has also failed. Mr. Horace G. Wadlin, Librarian of the Boston Public Library, has kindly written, Apr. 23, 1913:—"An exhaustive search of Boston daily newspapers for 1846 and 1847 has failed to reveal any information concerning G. W. Sleeper." Dr. Putnam writes:—"Search has also been made in the files of some of the Boston newspapers of that period [1849], but without avail. This search is not quite completed and if we should discover it I will inform you." Supposing that the pamphlet is genuine the remainder of the introduction, of which the first portion was quoted on p. 39, gives an explanation of the silence of the Boston Press.

" The first public delivery of either occurred in Boston about two years ago, it was, however, almost impossible to obtain a hearing for them so bitterly hostile did the audiences (assemblies little better than savages) prove themselves to be, and so persistently did they interrupt, and endeavor to overawe, the lecturer.

"Such being the condition of society, and as the press of this city, influenced by certain clergymen, have not seen fit to acquaint the public either with the substance of the ideas set forth or with the facts relating to the attempts to deliver the lectures containing them, I decided to put these subjects to print; as being the only way open to secure attention from the many fair and noble minds among our citizens who undoubtedly have Common Sense."

Comparison between G. W. Sleeper's pamphlets of 1849 and 1860.—We know that the date (Providence; 1860) of the later pamphlet, "Shall we have Free Speech?" is genuine; for the copy in the British Museum Library bears the stamp "June 9, 1864." This

* Mr. J. F. Sleeper informs me that this is an error and that his father did not return to Boston but went to New York in June 1866.

work is stated to be registered in "The District Court of Rhode Island," and I have asked Dr. Putnam if he will kindly ascertain whether it is actually entered in the records of the Court*.

The comparison between the two pamphlets is, in my opinion, unfavourable to the authenticity of the one with the earlier date. The undoubtedly genuine pamphlet contains nothing surprising, nothing that any able man, well read in the ethnology of his day, might not have inferred. Although the two works present obvious resemblances—for instance in the treatment of gunpowder—there is not the slightest hint in the later pamphlet of the existence of the earlier one, nor of any original view contained in it. And there is one passage at least where such reference was to be expected. Speaking in 1860 of the unsanitary conditions of ancient Greece the author says:—"Undoubtedly these tended to cause the great plague of Athens—which unheard of disease in modern times is no doubt owing to the superior education of man, whose vast accumulation of scientific facts are fast developing the origin and causes of great pestilences." (p. 13.)

History of the only copy at present known†.—By far the strongest evidence in favour of the authenticity of the earlier work is to be found in the history of the copy now presented to the Society, as given in the first part of this address (pp. 26–27). Many of the ideas *must* have been originated by the author, if they are printed in a pamphlet bought in 1891 or 1892 of a bookseller who then said that it was an old work and had been through many hands. This history destroys the validity of an objection which has been felt by many to whom I have shown the pamphlet—the very completeness and balance of the anticipations, and the fact that so many important modern ideas are touched off, often in a few lines. The views on the origin of life and on insects as carriers of disease must I think, under any circumstances, have been original, and those upon the germinal origin of characters and some of the thoughts on resistance almost certainly so.

The excessive rarity of the pamphlet is probably a point in favour of its authenticity.

The use of characteristic Huxleyan and Spencerian words.—When I read the pamphlet for the first time, I was struck with the employment of the word "Agnostic" as though it were in general use. The author is speaking, on page 15, of Education and what she has done for Man. He speaks of "her Commerce and Travels; her Printing Press and Schools; her Gunpowder and her Agnostic with his untrammelled thought,".

"Unknown Cause" on p. 5 and "vegetal" on p. 2 (we find "vegetable" on pages 9 and 19) suggest Herbert Spencer, but

* Dr. Putnam has now kindly sent me a letter from Mr. Thorvald Solberg, Register of Copyrights, stating that the title of the 1860 pamphlet was duly registered on April 27, 1860, but that no copy was deposited.—E. B. P. Aug. 12, 1913.

† I have since learnt from Mr. J. F. Sleeper that he possesses three copies of the pamphlet.—E. B. P. Aug. 12, 1913.

Sir James Murray informs me that "vegetal" is very old, going back even to Caxton (1490).

Huxley's creation of the word "agnostic" in 1869 is well known, but I think it will be of interest to quote the passages from the "Life and Letters" (London, 1900, vol. i. pp. 319, 320). Under the year 1869 we read:—

"..... How he came to enrich the English language with the name 'Agnostic' is explained in his article 'Agnosticism' (Coll. Ess. v. pp. 237–239).

"After describing how it came about that his mind 'steadily gravitated towards the conclusions of Hume and Kant,' so well stated by the latter as follows:—

'The greatest and perhaps the sole use of all philosophy of pure reason is, after all, merely negative, since it serves not as an organon for the enlargement (of knowledge), but as a discipline for its delimitation; and, instead of discovering truth, has only the modest merit of preventing error':—

"he proceeds—

'When I reached intellectual maturity, and began to ask myself whether I was an atheist, a theist, or a pantheist; a materialist or an idealist; a Christian or a freethinker; I found that the more I learned and reflected, the less ready was the answer; until, at last, I came to the conclusion that I had neither art nor part with any of these denominations, except the last. The one thing in which most of these good people were agreed was the one thing in which I differed from them. They were quite sure they had attained a certain "gnosis"—had, more or less successfully, solved the problem of existence; while I was quite sure I had not, and had a pretty strong conviction that the problem was insoluble. And, with Hume and Kant on my side, I could not think myself presumptuous in holding fast by that opinion.....

'This was my situation when I had the good fortune to find a place among the members of that remarkable confraternity of antagonists, long since deceased, but of green and pious memory, the Metaphysical Society. Every variety of philosophical and theological opinion was represented there, and expressed itself with entire openness; most of my colleagues were *-ists* of one sort or another; and, however kind and friendly they might be, I, the man without a rag of a label to cover himself with, could not fail to have some of the uneasy feelings which must have beset the historical fox when, after leaving the trap in which his tail remained, he presented himself to his normally elongated companions. So I took thought, and invented what I conceived to be the appropriate title of "agnostic." It came into my head as suggestively antithetic to the "gnostic" of Church history, who professed to know so much about the very things of which I was ignorant; and I took the earliest opportunity of parading it at our Society, to show that I, too, had a tail, like the other foxes. To my great satisfaction, the term took; and when the *Spectator* had stood godfather to it, any suspicion in the minds of respectable people that a knowledge of its parentage might have awakened was, of course, completely lulled.'

The following account of the origin of "Agnostic" is given in the great Oxford Dictionary:—

"Suggested by Prof. Huxley at a party held previous to the formation of the now defunct Metaphysical Society, at Mr. James Knowles's house on Clapham Common, one evening in 1869, in my hearing. He took it from St. Paul's mention of the altar to 'the Unknown God.' R. H. Hutton in letter 13 Mar. 1881."

Sir James Murray informs me that no importance can be attached to "clewless" (p. 5) of which the first quotation (in the form of "cleuless") is dated 1862 in the Oxford Dictionary.

At this point I must leave the problem, hoping to be able to add in an appendix or in an early communication to the Society the evidence which will enable us to reach a decisive conclusion.

[Since the delivery of the above address I have been in continual communication with Mr. John F. Sleeper, who has kindly permitted me to see much interesting manuscript with a direct bearing on the authenticity of the pamphlet. The new facts suggest further enquiries which are being undertaken but cannot be hurried. I therefore leave the address as it was delivered, save for a few necessary corrections and occasional notes, the latter with the date Aug. 12, 1913. The results will be communicated to the Society at the earliest possible date.

E. B. POULTON, Aug. 13, 1913.]

Upon the conclusion of the Presidential Address the Rev. T. R. R. STEBBING moved the following Resolution :—

"That the President be thanked for his excellent Address and that he be requested to allow it to be printed and circulated amongst the Fellows" which, having been seconded by Mr. H. R. KNIPE, was carried by acclamation.

The President, then addressing Lieut. Count WILHELM von BENTINCK-UND-WALDECK-LIMPURG, who attended from the German Embassy, related the reasons which guided the Council in awarding the Linnean Gold Medal to Professor ADOLF ENGLER, and handed the Medal to him for transmission to the recipient.

The President said :—

I ask you, Sir, to receive the Linnean Medal on behalf of Dr. Adolph Engler and to transmit it to him. I am indeed sorry not to see him here to-day so that I might express personally our appreciation of those great and long continued labours in the field of botany which have induced the Council of the Linnean Society to award to him the highest distinction it can bestow. At the same time we are all glad to know that the African journey which accounts for his absence is proof of his unimpaired vigour and unceasing energy.

It is now forty-seven years since Dr. Engler published his dissertation '*De Genere Saxifraga*,' and '*Beiträge zur Naturgeschichte und Verbreitung des Genus Saxifraga*,' to be followed, six years later, by an admirable monograph on the same genus.

In the "Beiträge," and still more so in the monograph, we find already laid down the lines along which his life work was to run,—classification and plant distribution on an evolutionary basis. The scope of his earliest memoirs was relatively narrow; but he soon extended his researches to other and larger groups, gradually producing a long series of more or less complete monographs and revisions of genera and families. We are equally astonished at the width of their range and the variety of their subjects. Some, such as the monographs on the Araceæ, Anacardiaceæ, and Burseraceæ, stand by themselves; others form parts of comprehensive works like the 'Flora Brasiliensis,' or 'Die Natürlichen Pflanzenfamilien'; others again, scattered through many volumes of the 'Botanische Jahrbücher' or embodied in the splendidly illustrated 'Monographien Afrikanischer Pflanzenfamilien und Gattungen,' serve to illustrate the amazing wealth of the African flora—that flora which, in later years, became one of the principal centres of his many-sided activity. Work of this class means analysis as well as synthesis; but for a mind so essentially constructive as Engler's, synthesis must always exercise the greater attraction, and accordingly we soon find him working in the direction of a comprehensive synopsis of the vegetable kingdom, raised on the foundation provided by Brongniart's system, but largely modified by the results of modern research and his own vast experience. As early as 1884, he gave us the outlines of such a synopsis in his "Führer durch den Königlichen botanischen Garten zu Breslau," and again in 1892 in the first edition of his 'Syllabus.' The synopsis itself, in the form of a profusely illustrated 'Genera Plantarum,' was obviously beyond the powers of any single individual. Engler therefore enlisted the services of a body of collaborators, many of them his own pupils; and, thus aided, the first part of the synopsis, known as 'Die Natürlichen Pflanzenfamilien,' appeared in 1887. The early death of Prantl, who had at first assisted him, threw the whole burden of the editorship of this colossal work on to Engler's shoulders; yet progress was never interrupted, and the year 1908 brought fulfilment. Completeness and uniformity of plan have made Engler's synopsis the standard work of modern botanical taxonomy; but his ambition was not satisfied. In 1900, long before the last part of the 'Natürlichen Pflanzenfamilien' had been published, a new and still more comprehensive work 'Das Pflanzenreich. Regni vegetabilis Conspectus' was begun on Engler's recommendation and under his direction. Following 'Die Natürlichen Pflanzenfamilien' in general plan, it is intended to be a collection of monographs ranging over the whole of the vegetable kingdom. It may take a generation to complete, and even then it will not be final; but it will set the coping stone upon the life work of a genius of enterprise and organisation.

Only eight years intervened between the publication of Darwin's epoch-making essay and the appearance of Engler's first paper, but he was already imbued with the new spirit, and, from the very beginning, the idea of evolution runs through his taxonomic

work, and inspires his conception of the problems of plant-distribution as a phase in a historical process. And as his taxonomic researches broadened more and more until they culminated in 'Die Natürlichen Pflanzenfamilien,' so his phytogeographical work soon developed into a comprehensive treatise on the evolution of the floras of the world, especially since the tertiary period. The first part of the "Versuch einer Entwicklungsgeschichte der Pflanzenwelt," dealing with the temperate floras of the northern hemisphere, appeared in 1879; the second, concerning those of the southern and tropical floras, in 1882. Since then so much has been added to our knowledge of plant-distribution in recent and past times, that many a detail would have to be corrected if the work were to be rewritten, but the main outlines would still stand and the spirit which pervades it still lives. In the meantime it has not been superseded, but remains, in its own subject, the standard work of to-day as it was 30 years ago. In some respects Engler himself has, as it were, recast and more fully worked out certain parts of his book. The evolution of the floras of Europe and especially of the Alps, and the differentiation of the floras of the vast African continent, have among others been subjects of essays from his fertile pen.

Just as Engler sought the help of collaborators for 'Die Natürlichen Pflanzenfamilien' and the 'Pflanzenreich,' concentrating and organising their efforts in the field of taxonomy, so has he laboured in the domain of phytogeography, and has given us another series of monographs under the title 'Die Vegetation der Erde,' of which 13 volumes have so far appeared. Two of these, dealing exclusively with the phytogeography of Africa, are from his own pen.

I have hitherto been speaking of monographs that fitted into the framework of a definite plan, but Engler has also provided in the 'Botanische Jahrbücher' a channel for independent papers and articles on taxonomic and phytogeographical subjects of the most varied character. Begun in 1881, the 'Jahrbücher' have now run to 48 volumes, and they are a veritable store-house of information towards which Engler himself has contributed not a little.

Immense and important as is the literary work connected, directly and indirectly, with Engler's name, it has never exhausted his energies. Aided by fortunate circumstances, supported by an enlightened government and helped by a staff of able assistants, he has organised for his country a centre of taxonomic, phytogeographical, and economic botany that has only one rival in all the world—the older sister institution at Kew. The botanic garden and botanic museum of old Berlin, with which the memories of Willdenow, Alexander Braun and Eichler will for ever remain associated, have been swallowed up in the splendid modern city, but they have arisen in Dahlem rejuvenated and on a scale worthy of the great empire which they are intended to serve,—another monument to the enterprise and power of

organisation of the man whom the Linnean Society desires to honour to-day.

If we seek for causes—other than the central force arising from the genius of the man himself,—which have helped on the success of his every enterprise, a lifelong connection with university teaching stands out as the most potent factor. Munich, Kiel, Breslau and Berlin mark the stages in his academic career. He gave freely of his knowledge and experience, but no great teacher gives without receiving back with ample interest. He lived in a vitalizing atmosphere of intellectual progress and untrammelled liberty of research: in it he taught and trained the young and discovered how to remain young himself. He has ever stood at the centre whence radiate the threads which are woven into that wonderful network of intellectual energy that covers his native land. Engler gathered the threads which concern his own department of knowledge, he has long held and still holds them with a masterhand.

There is one more point to which I would briefly refer,—his activity as a fieldworker. His holidays have always been spent in the search for new material, fresh observations, and in seeing for himself. They have carried him over most parts of Europe and the Mediterranean,—from England to the Caucasus and Greece, from the Baltic to the edge of the Sahara. At an age when most people begin to look for rest and ease he journeyed to the Karroo, the Falls of the Zambesi, Mount Kilimanjaro, to India, Ceylon and Java, not for pleasure, but for continued work, for new impressions and fresh ideas. At the present moment he is, as I have said, in Africa.

Next March Engler will complete his 70th year, and his countrymen and colleagues all over the world prepare to do him honour. I beg you, Sir, when you send the Linnean medal to him, to express also the sincere wishes of this Society that our distinguished Foreign Member of a quarter of a century's standing may keep his birthday in unimpaired health, in undiminished vigour and in readiness for another long period of fruitful labour,—that he may long remain what he has ever been, the man of thought and action.

The General Secretary having laid before the Meeting certain obituary notices of deceased Fellows and others, the proceedings terminated.

OBITUARY NOTICES.

With PAUL FRIEDRICH AUGUST ASCHERSON, whose death occurred at Berlin on March 6th of the present year, one of the most remarkable figures has disappeared from the ranks of modern German botanists. Paul Ascherson was born on June 4th, 1834, at Berlin, as the son of Dr. Ferdinand Moritz Ascherson, a prominent medical practitioner. He was educated at the Marggraff School and the Friedrich Werder Gymnasium at Berlin, and studied medicine in the university of the same city. In January 1855 he obtained the degree of Doctor of Medicine, and a year later he qualified for a medical practice. His inclination, however, lay with botany, which he studied under Alexander Braun, R. Caspary, and N. Pringsheim. In 1860 he became A. Braun's assistant, a post with which he united later on that of an assistant in the Botanical Museum, rising in the latter eventually to the rank of a second custos. This he held until 1884, when he retired. Having received the title of a Doctor Philosophiæ honoris causa from the University of Rostock, he qualified in the University of Berlin in 1869. Four years later he was appointed Professor extraordinarius and in 1908 Professor ordinarius honoris causa. He was also made a Geheimer Regierungsrat, and was connected with many learned Societies. The Linnean Society added him to its list of Foreign Members in 1905.

Ascherson's name will for ever remain connected with the study of the flora of his native country, to which he was devoted from his student days. Nearly all his earlier publications were concerned with it, and particularly with that of the Mark Brandenburg. As Professor Urban tells us, he conceived the plan of writing a flora of that province as early as 1855 on the suggestion of his teacher, A. Braun. He at once set to work with great enthusiasm and industry, exploring the province in all directions, and availing himself freely of the help of his numerous correspondents. In 1859 appeared the second and third, in 1864 the first part of his 'Flora der Provinz Brandenburg, der Altmark und des Herzogthums Magdeburg.' The thoroughness and methodical clearness of the work won him the admiration of his colleagues in the field of regional phytography, and it has for long been held up as a model of a local flora and is even now counted as a classic. After that he directed his attention and his labours to a wider field; but among the many attractions which his versatile mind encountered and which led him again and again into excursions into matters of a remarkable range of variety, he never lost sight of the real life task which he had set himself, namely, the elaboration of a comprehensive and exhaustive flora of Germany. The preliminary work spread over thirty years, and it was not until 1896 that the first sheets of his great work appeared. But by that time the matter had grown beyond the

original limits, and the political boundaries of a flora of Germany had given way to the more natural conception of a flora of Central Europe. But extensive as this "Synopsis der mitteleuropäischen Flora" was, it was to be not less intensive and exhaustive. The material that had accumulated in those long years was beyond the powers of a single man. Ascherson was moreover feeling the weight of his years. He associated himself therefore wisely with other workers in the same field, and especially with his young friend and pupil Paul Gräbner, who was destined to carry the monumental work further when the master should fail. By the time of Ascherson's death the 'Synopsis' had already filled 7 volumes. It is not here the place to criticise or appreciate the work in particular; but this much may be said, that it is unequalled in thoroughness and erudition and in the accumulation of details. It breathes Ascherson's spirit. His range of knowledge was encyclopedic. Thorough and painstaking to a fault, eager to make the most of the marvellous store of facts which his very long experience and extensive reading, connected with a wonderfully retentive memory, placed at his disposal, he was an unrivalled master of detail. Therein was his strength, and also his weakness in so far as he never seemed to be able to free himself from the fetters of his erudition. The volume which his friends published on the occasion of his seventieth birthday contains a list of his publications. It ranges from 1853 to 1904 and occupies no less than forty-four pages, a truly amazing output. They are, however, mostly short notices, covering the most heterogeneous subjects. There are, apart from his 'Flora der Mark Brandenburg,' and his 'Synopsis der mitteleuropäischen Flora,' only two subjects of a larger scope which fascinated him sufficiently to attempt really comprehensive treatment, namely, the marine phanerogams and the flora of Egypt. His monographs of the former are the best that have been written on those remarkable plants from the morphological as well as the taxonomic point. As to the flora of Egypt he collaborated with his friend Schweinfurth. His interest in that flora arose no doubt out of the cordial relations he had from early days entertained with the great African explorer, and it was deepened by repeated visits to Egypt. He first went with Gerhardt Rohlfs on his expedition to the Libyan Desert (1873-1874) and two years later went alone to the Little Oasis. In later years he accompanied Schweinfurth repeatedly on excursions in Lower Egypt. A number of smaller papers resulted from those travels; but the final outcome of his studies and collections on Egyptian soil was merged in a work of collaboration, 'Illustration de la flore d'Egypte,' which under his and Schweinfurth's joint authorship was published in Cairo in 1887 and followed by a supplement in 1889. It was in the nature of a critical enumeration of the plants then known from Egypt up to the Nubian frontier (22° N. lat.). In the absence of a "Flora" of Egypt and embodying in clear and concise exposition the unrivalled experience of the two foremost authorities on the plants

of the temperate portion of the basin of the Nile, it was an invaluable contribution to geographical botany. To turn from the flora of Egypt to that of its natural extension into Tripolitania was only a logical step; and so we find him soon lending a helpful hand to E. Durand and G. Barratte in the execution of their important 'Floræ Libycæ Prodromus' which appeared in 1910.

His travels were, however, not confined to Egypt. They also extended to many parts of Europe and were mostly undertaken in the company of congenial friends.

Wide and diversified as his interests were, there are many observations scattered through his writings that throw light on subjects only loosely connected with botany or quite outside it, particularly in the domain of ethnography and anthropology, towards which he was drawn through his friendship with Virchow. If his university career did not carry him to the forefront of academic life, he was nevertheless an important factor in that he understood to keep alive the contact between the university and the large number of free lances who, having been imbued with an interest of botany in their academic days, found in the study of their local flora a field to exercise it. Nowhere was this influence more evident than in the 'Botanische Verein der Provinz Brandenburg,' which was entirely his creation, and whose soul he remained to the end of his life. How beloved he was in those circles and how respected by his professional colleagues became manifest on the occasion of his 70th birthday, which was celebrated by the publication of a jubilee volume or "Festschrift. It will be long before another Ascherson will arise; but as to his main work, he has early taken care that it should be carried on in his spirit and with the promise of success. [O. S.]

Professor BENJAMIN JAMES AUSTIN was born at Horsley Down on April 5th, 1829. He was the first science teacher appointed by the Reading Science and Art Committee, in 1871, and for a long period he was the Secretary of the Reading Microscopical Society. When University College, Reading, was established in 1892, he became lecturer in Physiology and Hygiene, and his association with the College was only severed by death. In 1903 his portrait was presented to the College, and is hung in the Senior Common Room; four years later, the College conferred upon Mr. Austin the title of Emeritus Professor of Botany, and in 1911 he received the Associateship, *honoris causa*.

In a career of more than forty years, our late Fellow had been the stimulating teacher of a very wide circle of pupils, at Reading, and also at South Kensington; amongst these pupils was our President, Professor Poulton, F.R.S. Details of his earlier life are wanting; he was very reticent himself, and his early friends who could have spoken about it, predeceased him.

After a long illness he died on the 2nd June, 1912, and was buried amidst tokens of the greatest esteem, from his fellow townsmen and brother professors. His connection with this

Society dated from the 21st January, 1892, and he was little known to the Fellows as he avoided the evening meetings, though a constant reader and borrower of volumes from the library.

[B. D. J.]

JOHN BLAIKIE was born in the year 1837 and died on the 29th May, 1912, after a long illness. He was for many years proprietor of the White Barn Colliery, Knutton, but was at the same time identified with the North Staffordshire Field Club, of which he was an energetic promoter, so long as his health permitted.

His connection with the Linnean Society dated from the 6th April, 1882, and with the Geological Society from the same year.

His authorship seems to have been confined to sectional and other reports on botanical matters, in the local Society to which allusion has already been made.

[B. D. J.]

The Rev. R. ASHINGTON BULLEN, B.A., F.L.S., F.G.S., F.Z.S., F.R.A.I., Memb. Malac. Soc. London, was born in 1850, admitted a Fellow of this Society June 1, 1899, served on the Council, 1903-04, and died on the 14th August, 1912. His early years are reported on good authority to have been very busy but uneventful. He began teaching almost as soon as he left school, taking a mastership in Croydon, which with a short break he held for fourteen years; during these, on account of his mother's feeble health, spending all his available holidays with her quietly at home. Besides leading this unselfish life, he worked zealously for a long period in the cause of social purity. From his ordination in 1875, with one short interval, he was also engaged for thirty years in parochial work, first as a curate at Croydon, then at Farleigh, and from 1883 to 1888 at St. Margaret's, Westminster, under Canon Farrar, thereafter holding benefices successively in Kent, Surrey, and Huntingdonshire. In 1901 he published his treatise on "Harlyn Bay and its prehistoric remains," of which the third and much enlarged edition appeared last year. In this essay, full of interesting information in regard to that locality, he remarks, p. 130:—"All my time and labour spent at Harlyn Bay has been amply repaid by the discovery of *Hygromia montivaga*, Westerlund. This is a Lusitanian shell, and an entirely new record for England." For the bearing of this discovery on the origin of our English fauna, his chapter on the subject should itself be consulted. Besides his actual spadework in science, he was in other ways a most efficient helper in scientific efforts. In the South-Eastern Union of Scientific Societies, a provincial understudy of the British Association, he was successively treasurer, secretary, and vice-president, in these capacities for a dozen years rendering all manner of services to the Union, cordially assisted by his wife, taking trouble as if he enjoyed it, and smoothing away financial difficulties as if they had never existed. When acting as delegate to the British Association, he took a conscientious view of his duties, and made

an admirable report of the conference which he was commissioned to attend, setting an example which delegates in general would do well to follow. A trusty friend ! [T. R. R. S.]

FREDERICK MERRYWEATHER BURTON was born in 1829, and educated at Rugby, becoming in due course a solicitor, and from 1859 to 1902 the Registrar of the Gainsborough County Court. Although he had lost his right arm in consequence of an accident when shooting, he was not disabled from the duties of his profession. During his career he collected Lepidoptera and shells in the region round Lincoln, Grantham and Gainsborough, extending his excursions as opportunities offered ; these specimens are now invaluable vouchers of many species fairly common in the "forties and fifties" of the past century, which have now become rare, or even extinct.

Besides collecting in almost every branch of zoology, Mr. Burton was accustomed to bring back alpine plants from Norway, Switzerland and Canada, forming a most interesting and instructive series, combined with natives from Scotland and Wales, in his garden. Nevertheless, his chief interest and nearly all his writings were concerned with geology. He was President of the Lincolnshire Naturalists' Union for 1894-5, and he was largely instrumental in establishing the County Museum at Lincoln, to which he intended leaving his own collections, and a selection of his books. He became a Fellow of our Society 3rd June, 1886, and of the Geological Society in 1861. He died on the 17th May, 1912, at his residence, Highfield, Gainsborough. [B. D. J.]

Dr. JAMES CHARLES COX, who died at his house 'Glen Iris,' Raglan Street, Mosman, New South Wales, on the 29th September, 1912, was a well-known and prominent man in Sydney scientific circles. He was a grandson of Capt. William Cox, Paymaster of the New South Wales Corps, who arrived in Sydney in January 1800 in charge of Irish "Rebels," and the third son of Edward Cox, of Mulgoa, 40 miles west of Sydney, where he was born, 21st July, 1834 ; his mother was a daughter of one of the masters in the passenger trade from Great Britain to Australia named Brooks.

In an interview shortly before his death Dr. Cox gave some interesting particulars of his youthful days and early experiences of professional life in Sydney. He said :—

"When I was 14 I lived at Mulgoa, near Penrith. After attending the school at the Parish Church Parsonage under the Rev. Thomas Makinson, I was sent to the King's Shool, Parramatta, under the Rev. R. Forrest, where I remained three years. Owing to my early love of natural history, my father apprenticed me in Sydney to Dr. Henry Gratton Douglas for three years, and I then attended Sydney Hospital as a student under the late Drs. McEwan and Nathan. At the same time I was taken on by

the late Professor Smith as his assistant, when first he commenced lecturing on chemistry at the Sydney University, then in College-street, now the Grammar School.

"The museum at that early date was my delight, and I had a share in preparing the skeleton of the first great whale set up by Wall, and prepared the first perfect skeleton of a South Sea Islander ever made, which, in conjunction with Dr. Lynch, I articulated and set up for the museum.

"My apprenticeship having expired, I was sent to Edinburgh to study medicine at the University, and graduated there in 1857, taking out a diploma of Surgery at the Royal College of Surgeons of Edinburgh. Before leaving for Australia, in 1858, I was proposed by Professor Lyne as a Fellow of the College, then being the youngest Fellow ever elected, and through the lapse of time, I am now the fourth or fifth from the top of the list of living members in seniority."

Arrived in Sydney in 1858 he began medical practice, and also associated himself with the three prominent societies—The Linnean Society of New South Wales, the Naturalists' Society of New South Wales, and the Royal Society of New South Wales. It was during his presidency of the former society that a disastrous fire occurred in the premises of that society, destroying a part of its library. An appeal was issued to publishing societies, asking for contributions of publications to make good the recent losses, and our Council readily agreed to do all that could be done, to replace the destroyed sets, unless the loss were made good from other sources. This was in 1882, and during 1883 a letter of thanks was received for the offer.

The claims of a busy professional life did not permit Dr. Cox many chances of distinguishing himself as a writer, but to the end of his life he was regarded as the chief representative of biologic science in New South Wales. He was elected a Fellow of the Linnean Society of London on the 16th January, 1868, the same date on which the writer of this notice was elected. [B. D. J.]

HERBERT DRUCE was born in London on the 14th July, 1846, and became interested in entomology at a very early age, which not even the claims of a large business were able to efface. His most extensive work was that on the Mexican Lepidoptera Heterocera, forming two volumes of text and one of plates in Godman and Salvin's '*Biologia Centrali-Americana*,' beginning in 1881 and not yet complete. His smaller contributions to entomological literature consisted of monographs of genera and descriptions of new species which were added from time to time to his collection.

He became a Fellow of this Society on the 15th February, 1872, and served on the Council from 1892 to 1895, and from 1901 to 1903, being also a Vice-President in 1902-03. An active member of the Zoological Society, he served for two periods of six and five years on the Council of that body, during the last two years

as a Vice-President. The Entomological Society naturally was a source of great interest to him, and his fellowships also extended to the Royal Geographical Society, and Royal Horticultural Society; his bond with the latter being his collection of living orchids under cultivation.

After some months of failing health, he died on the 11th April, 1913, in the 67th year of his age. [B. D. J.]

THEODOR (THORE) MAGNUS FRIES was the son of Elias Magnus Fries, at that time Professor of Botany at the University of Lund; he was born on the 28th October, 1832, at Femsjö, in south-western Småland. In 1834 the family removed to Uppsala, where the elder Fries had been appointed Borgströmian Professor of Botany.

The younger Fries developed in the footsteps of his celebrated father. Botany became and remained his great love during life, and it was in its service that his life-records accumulated. As early as 1850 the first of his long list of botanical memoirs was printed, which gave the author an honourable place amongst his countrymen as a naturalist. For 25 years he was Docent in Botany at the University of Uppsala, till in 1862 he became Borgströmian Adjunct in Botany and practical Economy, and 1877 full Professor in the same subjects.

When the history of Swedish learning comes to be written, Thore Fries will certainly be regarded as an eminent member of the principal personalities during the latter half of the nineteenth century. He has been called "the last of the Linneans," and with good reason. Elias Fries felt it a deep obligation to preserve the inheritance from Linné's classic time, especially to maintain and pursue the principles of definition of species, which the Master once achieved, as the main support of natural history research. Most carefully he collected all traditions from Linné's pupils who were still living during the first decade of the last century, and to no better hands could he commit those traditions than those of his son.

The investigation of Linné's life, which took up the last twenty years of Fries's time, was also for him an early love, towards which, during the heavy labours of his middle age, he longed to revert. It is marvellous what a gigantic work he achieved: besides the great and well-known standard work 'Linné: lefnadsteckning,' 1903, he edited volume after volume of Linné's correspondence, together with publications which had not been printed before, or had been badly done. The inheritance from his father and grandfather, an easy knowledge of Latin, which made him supreme in the deciphering of Linné's manuscripts, stood him in good stead. It must not be forgotten, that it was upon Fries's powerful initiative, that the Linnean Foundation at Hammarby, now a State Possession, came into existence, and that he was the first Inspector.

It was also in the best traditional Linnean style that he brought out his '*Lichenographia Scandinavica*' in 1871-74, a work of known and accepted value. One of the greatest botanical achievements of the last century was the discovery that Lichens are not independent plants, but are an association of Algæ and Fungi. Fries had in '*Flora*' of 1866, on the cephalodia of lichens, made an important step towards the commonly received Schwendenerian views, but he stood out against it for long: so that it was an historical moment for his pupils when, in a lecture at the beginning of 1880, he openly avowed his conversion.

Fries shared in the Swedish expeditions to the North, such as Nordenskjöld's Spitzbergen journey in 1868, his Greenland voyage in 1871, and lastly to Finnmark in 1857 and 1884. Besides the scientific results of these journeys may be mentioned the popular volumes '*Svenska polarexpedition år 1868, med Kronoångfartyget Sofia*,' and his '*Greenland, its nature and natives*.'

The long period which Fries spent in academic service has left deep traces in Swedish education. The Museum at Uppsala was his work; through his widespread personal relations and energy he succeeded in forming an institution which worthily compares with many renowned continental museums.

It is related that when Fries began his teaching career he brought with him a fresh breeziness which had never before been displayed. He spoke simply and naturally, always to the point, and with an undercurrent of humour. His power of carrying with him even the most sluggish pupil was incredible. During his youth and a long period of his mature life he stood in the most intimate relation with the botanical world of Europe. Early accustomed to the modern microscope, he was one of the first in Sweden to introduce microscopical technique into botany, and the various problems set out by Darwin, Delpino, and Kerner in the sixties and seventies. Even during the last decade of the nineteenth century, when he was forced out of the course of scientific evolution by accumulated official commissions, he still worked hard to help others in those studies in which he could no longer partake or dominate.

He stood in direct relation to youth as few of his contemporaries did, the breadth of his personal activity was easily noticed amongst his pupils. His inspectorship of the Småland nation, and even of the Gotlanders was notable. On his 80th birthday (which he passed in bed) the Botanical section gave utterance as follows:—

"One autumn evening in 1852, some young naturalists met in a student's room at Uppsala and formed a botanic-zoological union, the first source of our Botanical section. It was you, Professor, who took the initiative in this, and during half a century you have been one of the most energetic workers and greatest powers. In numberless lectures you laid before us results of research in lichenology, mycology, arctic plant-life, and the field of botanical history, which have made your name renowned.

Who can number the members to whose first scientific attempts you gave counsel and help? To their brightest memories belongs your winning, warmhearted personality, the meeting point in both serious discussions and the conviviality of youthful gladness."

Fries was a man of practical bent, with a clear head and unwearied powers of work. It is not wonderful, therefore, that he should have been overwhelmed with official commissions. He was Rector during the period 1893-99. In the eighties and nineties he was *ex officio* a member of the educational committee, and an active member also. He was also a member of many learned academies and societies; in 1865 he was chosen into the Royal Academy of Sciences, and in 1888 a Foreign Member of the Linnean Society of London.

Homage of another sort came to him in no stinted measure; we may recall how the University of Uppsala, on behalf of the wide circle of the scientific world, devoted a unique celebration on his 80th birthday, barely half a year ago. The Swedish Botanical Club devoted to him a large volume of essays from 35 writers, amounting to 600 pages, on whose first page we read:—

"To the Swedish botanists' Nestor, Theodor Magnus Fries, Lichenologist, Polar explorer, Museum builder, Linné-investigator, the man who more than any other of his time had the power to make botanic science known and loved in the whole of our Country, the incomparable teacher and friend."

With his death the old Uppsala times seem to have gone down also into the grave. During 125 terms he saw his beloved University grow and flourish with renewed vigour, but whilst much was altered, he could recall in his wonderful memory occurrences in the days of Elias Fries, Wahlenberg, and the historian Geijer (whose statue fronts the University); perhaps the time may come when others may talk of Fries's Uppsala.

The Linnean Bicentenary occasioned a vast amount of work to fall upon Fries, in translating Linnean documents and scarce pamphlets from Latin into Swedish, including the 'Flora lapponica'; and only recently he finished supervising a new edition of Linné's 'Iter lapponicum' from the MS. possessed by this Society. Six volumes of the Linnean correspondence have been issued, accompanied by copious notes concerning men and things, of which he seemed to have almost the monopoly, and the notes are specially valuable and helpful to understanding many Linnean allusions. He paid our Society several visits and took copious notes of the Linnean MSS. which he wove into his splendid life of Linné, apparently having, along with his earlier co-worker in Linnean matters, Dr. Ewald Åhrling, extracted everything possible, in an incredibly short time. Those who knew him will preserve a warm place in their hearts for a man whose death leaves a blank which it is hardly possible to fill.

The strenuous work of the last few years seems to have told upon the constitution of the Emeritus Professor. Last year he was at times laid aside by short periods of indisposition, one of

them occurring, as previously mentioned, on his 80th birthday; on the 29th of March last he died, and in token of respect, the flags on the University buildings and those belonging to the various "Nations" were hoisted half-mast high on that Saturday afternoon. [B. D. J.]

The Rev. JOHN GERARD, S.J., who died at Farm Street, on the 13th December, 1912, at the age of 72, was a familiar figure at our Meetings, where his attendance was regular until a few months before his death.

He was a son of Colonel Archibald Gerard, and a brother of the late General Sir Montagu Gerard, K.C.B., and was born in Edinburgh on the 30th May, 1840. Our late Fellow was educated at Stonyhurst, and entered the Jesuit novitiate in 1856, taking his B.A. at London University in 1859, and was ordained in 1873. After teaching at Liverpool, he was transferred to Stonyhurst, and there remained till his removal to London in 1893.

At Stonyhurst his influence in teaching zoology and botany was marked, his position as Prefect of Studies giving him the power to carry out his views. A preliminary Flora of Stonyhurst came out in the school magazine for 1886, and a second edition appeared in 1891, at Clitheroe, and although anonymous, is known to have been chiefly written by Father Gerard. For some time he was busy in criticising some of Grant Allen's essays, which were referred to by Father Gerard as 'Essays in Un-natural History.' His most important work was a volume in answer to Haeckel entitled 'The Old Riddle and the Newest Answer,' which has had a large circulation.

He was elected Fellow on the 3rd of May, 1900. [B. D. J.]

HENRY GROVES, whose death took place at Clapham on November 2nd, 1912, was born in London on October 15th, 1855. He was educated at the grammar school at Godalming, where the family had removed to in 1863. It was here where, under the guidance of the principal of the school, Mr. P. Churton, he was first imbued with the love of nature and trained in collecting and observing. The early death of his father forced him, when only fourteen, into a practical career. He went back to London and served in a stockbroker's office until he was twenty-four. He was eventually placed on the regular staff of the Queen Anne's Bounty Office, where he rose to the position of a senior clerk. The habit of making excursions for the purpose of collecting and studying animals and plants, acquired so early, persisted and developed more and more after the removal to London. For some time the interest was divided between fresh-water mollusca and plants, but in the end botany held the field. In his work, in so far as it concerned this department of science, he was from the beginning so intimately associated with his brother James, that it is

almost impossible to apportion their relative share in it, although he seems to have been the "predominant partner."

For many years Henry Groves was a keen field-botanist, and his own and his brother's contributions to Townsend's 'Flora of Hampshire' were as numerous as they are valuable. It was in those days that they discovered and described the remarkable "rice grass," *Spartina Townsendii*, the spreading of which assumed subsequently such astonishing proportions. The work, however, for which Henry Groves, along with his brother, was best known to this country as well as abroad, was on the Characeæ. "A Review of the British Characeæ" (1880) followed by a series of "Notes on British Characeæ" (1881, 1883, 1884, 1885, 1886, 1887, 1890, 1895, 1898), all in the 'Journal of Botany,' a beautifully prepared 'Characeæ Britannicæ Exsiccataë,' of which the first fascicle appeared in 1892 and the second in 1900, and finally a contribution to Urban's 'Symbolæ Antillanæ' dealing with the West Indian Characeæ, were the fruits of the joint labours of the brothers in this department. British botanists are also under a debt to Henry Groves for his share in the preparation of the ninth edition of Babington's Manual of British Botany' (1904). Tied down by the limitations imposed upon them, the brothers had to leave the book as regards plan, nomenclature, and descriptions much as they found it in the author's interleaved copy. Nevertheless, they were able to introduce a considerable amount of additional matter, thus contributing largely to the value of the edition. Another field in which Henry Groves interested himself was that of botanical nomenclature, as is shown by a number of articles in the 'Journal of Botany.' It may finally be added that he was also a draughtsman of considerable skill.

Henry Groves joined the Linnean Society in 1892. He served on the Council from 1899 to 1902, and again from 1911 to his death; and in 1910 he acted as one of the Society's delegates at the International Botanical Congress at Brussels.

His common-sense, practical experience, and independence of character made him a most valuable member of committees, just as his frankness, allied with discretion and kindness, won him the esteem and affection of his friends.

He was also a Trustee of the South London Botanical Institute. [O. S.]

WILLIAM THOMAS HINDMARSH, who died at his house, Alnbank, near Alnwick, on the 27th April, 1913, was by profession a solicitor, but strongly drawn to the study of living plants. In his garden, about 4 miles from the north-eastern coast, he successfully cultivated alpine and Japanese plants. He was the first in this country to flower *Primula deorum*, Velen., and was also very fortunate in cultivating the two species of *Shortia*, *S. galucifolia* and *S. uniflora*: these he described in a paper in the Journal of the Horticultural Society in 1905.

From the year 1872 he had been a member of the Berwickshire Naturalists' Club, of which he was President in 1895; his Presidential Address urged the importance of field-work and systematic observation in botany, apprehending that they were being overshadowed by the work of the laboratory.

He was greatly interested in Mendelian research, attended the Genetic Conference in London in 1906, and intended to be present at the 4th *Conférence Internationale de Génétique* in Paris in 1911, but his health prevented his presence; he was, however, awarded a Mendel medal; apparently he meant to write a paper for that conference, but it has not been found amongst the papers he left.

He was elected a Fellow on the 21st February, 1889, and died as mentioned above, aged 65. [B. D. J.]

ALLAN OCTAVIAN HUME, C.B., was the youngest but one, the eighth child of Joseph Hume, the well-known economic and social reformer. Allan was born in 1829, and after training at Haileybury, entered the service of the Hon. East India Company in 1849, and was drafted to the Bengal Presidency, arriving on the 7th March of that year. Subsequently he served in the N.W. Provinces, as they were then called, as Collector, and was at Etawah in 1858, when the Indian Mutiny broke out; he raised a local force, and distinguished himself in several engagements. For this he was created C.B. in 1860, and awarded the medal with clasp. He knew the vernacular languages of the people amongst whom he was set to rule, and was known and liked by them in return in a very uncommon degree.

In 1867 he was appointed Commissioner of Customs for the N.W. Provinces, Punjab, and Central Provinces, and succeeded in carrying through the abolition of the salt-barrier. He became officiating Secretary to the Government of India, Home Department, in 1870, the following year he was Secretary in the Department of Revenue, Agriculture and Commerce. During his early official career he was energetic in pushing forward free schools in his own district of Etawah; and later on, he was distinguished by a fearless independence of action and conviction, candidly speaking his opinions on police reform and liquor traffic. This unusual outspokenness and independence were naturally not to the taste of his official superiors; he was consequently superseded in his secretaryship; in 1879 he was appointed a Member of the Board of Revenue, but retired from the Indian Service in 1882.

Perhaps the most striking part of his career was subsequent to his retirement, when he devoted himself as a private individual to advancing the aims of the Indian Nationalists. The first gathering of the Indian National Congress was held in 1885, and may be said to be the work of our late Fellow.

His observations on Indian birds were issued as 'My Scrap-Book, or Rough Notes on Indian Oology and Ornithology,' only two numbers of which were published at Calcutta in 1869 and

and 1870, 'Nests and Eggs of Indian Birds,' 1873-75, ed. 2, London, 3 vols. 1889-90, and 'The Indian Ornithological Collector's Vade Mecum,' 1874. He was editor of the eleven volumes of 'Stray Feathers,' 1873-99; and joint-author with C. H. T. Marshall of the 'Game-birds of India, Burmah, and Ceylon,' 1879-80. With Dr. G. Henderson, he wrote 'Lahore to Yarkand,' 1873.

He quitted India in 1890 and took up his residence in Norwood; and here he devoted himself to amassing an herbarium, and library to correspond, which, when it amounted to 40,000 sheets, he founded in 1911 as the 'South London Botanical Institute' at 323 Norwood Road. The sum of £15,000 has been bequeathed in his will, for the maintenance of the Institute. He was elected a Fellow of the Linnean Society so recently as 18th April, 1901, and died on the 31st July, 1912, at his house in Upper Norwood, at the age of 83; the last surviving son of his father. His wife, whom he had married in 1853, had died twenty years earlier. [B. D. J.]

By the death of FREDERICK HALSEY JANSON at Brighton on the 1st May this year, the Linnean Society has lost its oldest Fellow, and the legal profession its senior solicitor. On the 8th February he celebrated his 100th birthday, being honoured by a congratulatory message from the King.

In 1835 Mr. Janson was admitted an attorney and solicitor, becoming at that date a partner in the firm of Smith, Bailey, and Janson, whose records are stated to extend back to 1728, and still practising under the title of Janson, Cobb, Pearson & Co.

On the 21st March, 1837, he was elected Fellow of this Society, and therefore was connected with it for more than 75 years.

He retired from active practice in 1900, but annually took out his license; since his retirement he lived at 8 Fourth Avenue, Hove, in which house he died. He was buried at Chislehurst, Kent, where his wife, who predeceased him, was also buried.

[B. D. J.]

WILLIAM FORSELL KIRBY was born at Leicester on the 14th January, 1844, the eldest son of a banker in that city, and was educated by private tutors; like so many similarly trained, in after life he lamented the loss of school experience and training. At the age of seven he was brought to London on a visit, and then saw the British Museum, in which institution so many hard-working years were to be spent by him at a later period. On removing a short distance outside Leicester, Kirby was encouraged by his mother to collect butterflies, thus calling forth the first manifestation of the entomologist.

Samuel Kirby died in 1854, and our late Fellow, then a boy of ten, moved with the family to Burgess Hill, and soon afterwards to Brighton. In spite of his tender years, he joined the Brighton

and Sussex Natural History Society, and as early as 1856 he contributed to the 'Entomologists' Weekly Intelligencer' and drew up a list of European Butterflies, the first English work of the kind. In 1860 he came to London, and joining the Entomological Society in the following year, he made the acquaintance of the leading entomologists of the time. In 1866 he married Johanna Maria Kappel, of Hilden, near Düsseldorf, whose help in his literary work was invaluable; their only son, Dr. W. Egmont Kirby, has issued some entomological works. Kirby became assistant in the Museum of the Royal Dublin Society in 1867, the year his only child was born; but on the death of Frederick Smith in 1879, he removed to London, and took up duty in the zoological department of the British Museum, then at Bloomsbury, and kept up his connection with that institution till the year 1909, when he retired under the regulation for age.

During his official life he was actively busy in the preparation of volumes which are still invaluable to the worker in entomology. The sight of H. W. Bates's MS. list of insects suggested probably the most useful of Kirby's volumes, his well-known 'Synonymic Catalogue of Diurnal Lepidoptera' 1871, Supplement in 1877. A similar volume, 'Lepidoptera Heterocera; Sphinges and Bombyces,' 1892, is unfortunately left incomplete, owing to insufficient support. He compiled several Catalogues for the British Museum, as 'Tenthredinidæ' 1883; and 'Odonata' 1890; Orthoptera, in 3 vols., 1904-10.

From 1869 to 1884 he contributed the reports on Lepidoptera to the 'Zoological Record,' and for some years the entire department of entomology in that series rested upon him. Introductory works were also produced by him, but his activities were not bounded by his scientific studies, for he also published a translation of the great Finnish epic, the "Kalavala."

From what has been said it will be understood that his knowledge of entomological literature was not only great, but was unrivalled. As stated, he joined the Entomological Society in 1861, and the Linnean Society on the 17th April, 1890, and was a member of other associations, literary and scientific, which took up much of his spare time. He died on the 20th November, 1912, after a short illness, and was buried at Chiswick Cemetery on the 26th following, in the presence of many fellow-workers in his favourite branch of science. [B. D. J.]

FRANCIS GRAY SMART, who was born in January 1834, was the son of a medical man and was educated for the same profession. He entered Caius College, Cambridge, and graduated B.A. in 1867, proceeding M.A. in 1871, and also taking his B.M. degree. Soon after this he settled at Bredbury, Tunbridge Wells, and identified himself with all philanthropic movements. He gave freely to hospitals and local institutions for helping the poor, and in educational matters he founded the Frank Smart Scholarships, one at Caius in 1887 and another for the University in 1904 as

hereafter mentioned, in memory of his deceased son, an undergraduate of Cambridge.

Dr. Hugh K. Anderson, Master of Gonville and Caius College, has been so kind as to communicate the following information concerning the munificence of Mr. Smart in founding these scholarships and other benefactions.

"Francis G. Smart and Marian his wife by deed dated Feb. 6, 1888, gave £2000 4% Great Eastern Debenture Stock, to found a prize and studentship 'for promoting a scientific study of botany.' The prize consisted of books to the value of £6. The main conditions of the studentship are:—That it should be, generally speaking, tenable for two years; that it should be open to any member of the University who has taken honours in Part I. of the Natural Science Tripos, he, of course, becoming a member of the College, if not already so: *not* to be awarded by a competitive examination, but the candidate to give evidence of his carrying out 'original investigations in botany.' The Studentship to be termed the 'Frank Smart Studentship.' Its present value is about £100." The donor subsequently increased his benefaction in 1896, thereby raising the income from £90 to its present amount; and after its death, it was found he had still further augmented the income of the University Studentship to £200 per annum.

The names and dates of the Frank Smart students are as follows:—

P. Groom, 1888–90; J. C. Willis, 1890–93; F. W. Keeble, 1893–96; R. H. Biffen, 1896–98; H. H. W. Pearson, 1898–99; R. H. Yapp, 1899–1902; R. H. Lock, 1902–04; J. M. F. Drummond, 1904–06; F. T. Brooks, 1906–08; R. H. Compton, 1909–12.

'I copy the following passage from the 'University Reporter,' May 10, 1904, p. 766:

"The Council are informed by the Professor of Botany that Mr. Francis G. Smart of Gonville and Caius College, has offered to found in the University a Studentship of £100 a year for the encouragement of botanical research to be called the 'Frank Smart University Studentship of Botany.' Among the regulations are:— 3. Graduates of the University are eligible for the Studentship provided that not more than fourteen complete terms have elapsed after their first term of residence. 4. The appointment to the Studentship shall be made by the Vice-Chancellor, the Master of Gonville and Caius, and the Professor of Botany. 5. The successful candidate shall devote himself to research under the direction of the Professor of Botany. Mr. Smart also gave £100 to the redecoration of the College Hall and £50 towards providing bookcases in the Old Hall, now converted into an additional Library.'"

Prof. Seward has also kindly supplemented the foregoing remarks by these additional items:—

"In 1904 Mr. Smart founded a second Studentship of the

same value open to all Graduate Members of the University. This has been held by Mr. A. M. Smith, Mr. Thoday, Mr. S. Mangham, and Mr. Price. In 1909 the same generous benefactor gave to the University a capital sum to provide two Prizes, known as the Frank Smart Prizes, to be awarded annually to members of the University for proficiency respectively in botany and zoology in Part I. or Part II. of the Natural History Tripos. The Department of Botany has also directly benefited by Mr. Smart's liberality; a few years ago, in response to a public appeal for funds, he contributed a sum of £500 for the purchase of additional Museum cases and for other purposes. It is not too much to say that Mr. Smart's benefactions have played a very important part in the growth and efficiency of the Cambridge Botany School during the last 24 years. The Studentship is available at the most critical period of a student's career, when it is of the greatest importance that some means should be provided for enabling men to show what capacity they have for the prosecution of research, and without such assistance as the Studentships afford, a student would in many cases be compelled to leave the University without the invaluable training which is placed within his reach by Mr. Smart's benefaction."

Two years ago Mr. Smart was knocked down in London by a motor-car, and though it was hoped he had escaped serious injury, his health failed since that time, and he passed away on the 7th April, 1913, in the 70th year of his age.

He was elected a Fellow of this Society on the 20th December, 1883. [B. D. J.]

SIR CHARLES WHITEHEAD, who died on the 29th November last at the age of 78, had been connected with our Society for the long period of 41 years, having been elected a Fellow on February 2, 1871; his certificate being signed by Sir John Lubbock, H. T. Stainton, and Francis Pascoe.

He was born of Kentish parents on the 7th May, 1834, and was educated at Tonbridge School. The original intention of his parents was that he should take Holy Orders, as two of his forbears had been clergymen. Owing, however, to his delicate health, it was decided that he should take up farming as an occupation, so he was sent to Mr. Squarey, a well-known land agent then farming 1600 acres near Salisbury. In some privately printed 'Retrospections' issued towards the end of his life, he said that "the four years in Wilts passed all too quickly, resulting in a confirmed taste for literature and a practical knowledge of agriculture, an ardent love of hunting, and a useful seat in the saddle."

For a long series of years he was engaged in agriculture in Mid-Kent; farming 250 acres of hop, fruit and corn land, besides 240 acres of grazing land in Romney Marsh. This farm he relinquished in 1879, finding "depression lowering over agriculture and having much county business and work connected with the

Royal Agricultural Society." That Society he had joined in 1857, and was elected a Member of its Council on the 8th December, 1869. It was at his instance that a "Seeds and Plants Diseases Committee" (subsequently called the Botanical and Zoological Committee) was created by the Council in 1871, and he was elected its first Chairman, retaining that position till 1899. He wrote many papers and reports for the Royal Agricultural Society's Journal on botanical and zoological subjects, particularly on Market Gardening, Hop Cultivation, Fruit Farming, Potato Culture, and the Agriculture of Kent. He was elected a Vice-President of the Royal Agricultural Society in February 1889, and in the same year was appointed one of the nine original Trustees under the Lawes Agricultural Trust.

In 1887 he became Agricultural adviser of the Veterinary Department of the Privy Council, and was continued in that office when the Board of Agriculture was established in 1889. He wrote for the Government various reports on injurious insects and fungi, especially on the Hessian fly, Rust or Mildew on Wheat Plants, potato disease, wire-worms, smut of corn, and clover fungus; besides papers on ensilage and fruit-evaporation. He retired from this position in 1899 in view of a carriage accident that brought on neuritis, rendering scientific investigations involving much research and microscopical examination impossible for him. He gave evidence on Hop and Fruit growing before the first Royal Commission on Agriculture (1879), and was a member of the second Commission appointed by Mr. Gladstone in September 1893, which did not complete its labours till May 1897. In his later years he removed from Barming House, Maidstone, to St. Leonards-on-Sea, where he lived in retirement until his death.

For his services to agricultural improvement he was knighted by King Edward VII. at Buckingham Palace on the 16th December, 1907.

He was a cultured man of refined and literary tastes, and undoubtedly did much to bring under public notice the means of keeping farm pests—both animal and vegetable—under control. On the particular subjects that he had made his own, he was rightly regarded as an authority. [ERNEST CLARKE.]

June 5th, 1913.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the Anniversary Meeting of the 24th May, 1913, were read and confirmed.

Mr. Charles Oldham was admitted a Fellow.

LINN. SOC. PROCEEDINGS.—SESSION 1912-13.

f

Mr. Archibald Joseph Brooks and Mr. Edward Edgar Pescott, were proposed as Fellows.

Mr. James Donald and Mr. Leslie Frank Newman, M.A. (Cantab.), were elected Fellows.

The President announced that he had appointed the following to be Vice-Presidents for the ensuing year :—Sir FRANK CRISP, Bt., Mr. HORACE W. MONCKTON (Treasurer), Prof. A. C. SEWARD, and Dr. A. SMITH WOODWARD.

The President exhibited eight coloured slides of Lepidoptera *in situ*, by Mr. A. H. HAMAN of the Hope Department, Oxford. The very successful rendering of the natural tints had been obtained by the Paget Colour Process.

He also showed a remarkable case of mimicry where a Fossorial wasp was mimicked in habit and method of flying, by a Reduviid bug, and a Locustid. The examples were found flying together in a forest road between Santos and S. Vicente, Brazil, by Dr. A. Seitz of Darmstadt.

Mrs. LONGSTAFF, F.L.S., exhibited a striking specimen of synanthry in the Foxglove, which had grown in Dr. Longstaff's garden; whilst recalling the specimen shown by Sir Frank Crisp on the 15th June, 1911, it had a larger and more open terminal and synanthic flower.

Dr. Stapf commented on the interest of this exhibition.

Mr. HORACE W. MONCKTON, Treas. & V.P., showed a flower of *Sisyrinchium angustifolium*, Mill., which had been found on Dartford Heath a short time before.

Mr. C. H. Wright, A.L.S., recalled other localities where this alien had been gathered. Dr. Stapf added a few remarks.

Miss L. S. GIBBS, F.L.S., then gave an abstract of her paper entitled "A Contribution to the Flora and Plant-Formations of Kinabalu and the Highlands of British North Borneo," illustrating her remarks with a series of lantern-slides.

A discussion followed, the participants being Mr. H. N. Ridley, Dr. Stapf, the Rev. T. R. R. Stebbing, and Mr. E. G. Baker, Miss Gibbs briefly replying.

Mr. HUGH SCOTT, M.A., F.L.S., contributed a paper on the Histeridæ of the Percy Sladen Expedition to the Seychelles, which was read in title.

Mr. A. D. COTTON, F.L.S., explained the principal points of Mme. WEBER-van BOSSE's paper on the Red Marine Algæ from

the Indian Ocean, in continuation of a former paper by Mr. & Mrs. Gepp; the paper was communicated by Prof. J. STANLEY GARDINER, F.R.S., F.L.S.

The two following papers were also communicated by him:—Mr. JAMES G. NEEDHAM, on Myrmeleonidæ, and Mr. W. L. DISTANT, on Rhynchota from the Seychelles—Part I. Heteroptera.

The last paper, by Prof. R. J. HARVEY GIBSON, M.A., F.L.S., on *Mystropetalon*, Harv., was briefly explained by Dr. Stapf. The material was sent by Mrs. Solly of Sir Lowry's Pass as *M. Thomii*, but was found to differ; the rhizome was attached to roots of *Protea*. A very intractable brown deposit in the cells is not 'Balanophorin,' but some unknown carbohydrate of the cellulose group, for which the name 'Mystrin' is proposed. The male and female flowers are described, and the name of *M. Sollyi* proposed for the species.

June 19th, 1913.

Prof. E. B. POULTON, F.R.S., President, in the Chair.

The Minutes of the General Meeting of the 5th June, 1913, were read and confirmed.

Mr. Leslie Frank Newman, M.A. (Cantab.), Mr. Robert Paulson, and Dr. Thomas Harvey Johnston, M.A., were admitted Fellows.

Mr. Charles Daley and Dr. George Blundell Longstaff, M.A. (Oxon.), were elected Fellows.

The President announced that a dinner would take place on Thursday, 30th October next, at 7 P.M., to inaugurate the new Session, and that details would be circulated in due course.

Mrs. LONGSTAFF, F.L.S., exhibited feeding-tracks of Gastropoda, stating that these had been obtained from Twitchen, Morteheo, N. Devon. (Abstract, p. 70.)

The President and Mr. H. N. Ridley spoke on the subject thus brought forward.

Mrs. LONGSTAFF also showed two specimens of Foxgloves, the stems of both being spirally twisted, and in one there was cohesion of two stems for about two-thirds of their length, the flowers being confined to the upper free third.

A discussion followed in which the following joined:—Dr. A. B. Rendle, the General Secretary, Prof. G. C. Bourne, Sec.L.S., Mr. A. O. Walker, and Dr. R. R. Gates.

Mr. EDMUND G. BAKER, F.L.S., gave an abstract of his paper on the "African species of the genus *Crotalaria*," illustrating the sections by lantern-slides.

Dr. Rendle followed with some additional remarks.

Dr. W. T. CALMAN, F.L.S., explained the subject of his paper "On *Aphareocaris*, nom. nov. (*Aphareus*, Paulson), a genus of the Crustacean Family Sergestidæ," which was further discussed by Mr. A. O. Walker and Prof. G. C. Bourne, Sec.L.S.

Miss FULLER exhibited a series of water-colour drawings of Australian and Cape Flowers, introduced by Mr. N. E. BROWN, A.L.S., who compared the striking features of the two floras.

A paper by Dr. AGNES ARBER, F.L.S., "An anatomical study of the cone-genus *Lepidostrobos*," in her absence and at her request was read in title.

Mr. G. H. WAILES, F.L.S., having contributed his paper "Fresh-water Rhizopoda from North and South America," an abstract was read by the Zoological Secretary.

"A Revision of the Genus *Symphytum*," by CEDRIC BUCKNALL, Mus. Bac. Oxon. (communicated by Mr. J. WHITE, F.L.S.), was laid before the Society in abstract.

A short discussion on a point of nomenclature was raised by Dr. W. T. Calman, and continued by Dr. Rendle, the General Secretary, and Mr. N. E. Brown.

The Zoological Secretary epitomized the contents of Mr. STANLEY KEMP's paper:—"Pelagic Crustacea Decapoda of the Percy Sladen Expedition in H.M.S. 'Sealark,'" communicated by Prof. STANLEY GARDINER, F.R.S., F.L.S.

Dr. C. E. MOSS then introduced the recent discoveries in Britain of varieties of certain plants, instancing 3 varieties of *Populus nigra* and as many of *Alnus glutinosa*, *Ranunculus ficariae-formis*, *Primula scotica* var., *Lycium barbarum* confused with *L. chinense*, both of which occur, and the Orchids, *Gymnadenia Wahlenbergii* and *G. densiflora*, both figured by Reichenbach.

Dr. Rendle, Mr. F. N. Williams, Mr. E. G. Baker, and the General Secretary engaged in the discussion which followed.

ABSTRACTS.

On a Problem in Weismannism. By A. C. F. MORGAN, F.L.S.

[Read 1st May, 1913.]

DISCUSSING the cases in which reproduction is confined practically exclusively to one individual in the hive, that is the so-called "Queen," the author suggested that Natural Selection has operated in the following manner:—

"It seems to me that if a queen or real female produced descendants which had a tendency to be sterile, and remain in the hive and feed the queen, this tendency would be acted on by Natural Selection, because such a queen being highly fed in the hive would probably produce a large number of eggs which would produce descendants inheriting sterility and the same apparent affection for the queen. Some of these might (as they do, without enquiring now into the cause) develop into real females (queens), which, however, would also inherit the same tendency to produce sterile workers.

"No doubt the queens born from this mother would "swarm" and be mated by drones (males) of another stock, and this would be a check on the continuation of the particular characteristic which we are considering, but those queens which did produce sterile workers would have the great advantage of breeding individuals which fed and nourished them to an inordinate extent without any trouble to themselves (the queens), whereas those that did not breed this type would have to go out and forage for themselves and would more nearly approach the wasps, or the solitary bees, and would in consequence lay many less eggs than the pampered queen-bee fed by the workers in the hive. This explains, I think, the cause of so large a number of workers being produced.

"I have, therefore, endeavoured to show that it would be a distinct advantage to the parent queen to produce sterile workers who would attend on her and feed her, and an advantage to the race, as she is then able to produce a large number of eggs and the larvæ are well cared for. It must be noted that the loss of power to reproduce seems to be counterbalanced by a considerable amount of intelligence in feeding the queen, constructing cells and feeding the young, but this intelligence may have been much over-rated, as Lord Avebury has pointed out, in some of his experiments with ants and bees.

"The mechanical modifications of the genital organs, as shown by Mr. Frank Cheshire, in the workers rendering the visit of the males impossible, may be explained as a collateral modification in connection with the degeneration of the ovaries.

"But whilst I have endeavoured to show that Natural Selection has effected the preservation of a race of sterile or degenerate females, and this is probably being increased through artificial

selection by apiarists on account of the increased production of honey, yet this degeneration through the sterility of the workers has introduced an element of danger to the race, because the power of reproduction is practically confined to one individual, the queen, and should she come to a sudden end the whole hive might become extinct."

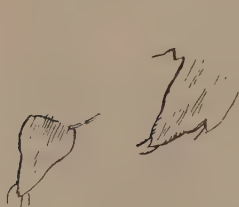
Feeding-Tracks of Gasteropoda. By JANE LONGSTAFF, F.L.S.

[Read 19th June, 1913.]

WHEN at Twitchen, Morteheo, N. Devon, during the months of August and September last year, I observed curious markings on the glass roof of a cucumber frame which had been coated with whitening. They were evidently made by some animal and brought to my mind figures of the feeding-tracks of *Helix aspersa*, Müll., published by Mr. Taylor in his Monograph of the Land and Freshwater Mollusca of the British Isles (vol. i. p. 260, fig. 520, Nov. 1899, and vol. iii. p. 247, figs. 321 & 322, July 1910). The tracks described by him were similarly made on the whitening on greenhouse roofs, the first at Christchurch, Hants, and the others at Berkhamstead, where they were photographed by the Rev. Dr. Norman. Upon comparison I found, however, that though the tracks in our garden greatly resembled these figures they were evidently formed by a different species.

As Mr. Taylor considers that each species has a characteristic movement of the head when feeding, it seemed worth while to investigate the matter further. I therefore placed a specimen of *H. aspersa* on the glass, and found the impression left by it the same as Mr. Taylor's figures. A search amongst some vegetable refuse at the side of the frame brought to view two large examples of *Limax maximus*, Linn. I then put one of these on a pane

1.



Helix aspersa.

2.



Limax maximus.

where the whitening was intact, and the result was the production of the track here exhibited, which is exactly similar to those first noticed.

The tracks of these two species, *H. aspersa* and *Limax maximus*, agree in being formed of a series of pointed impressions disposed in curved rows, sometimes making a zigzag, where the mollusc has advanced more or less regularly and at an even pace; at other times mixed up, where the mollusc has moved irregularly or has crossed its own track. Each point represents a lick of the radula, and where the animal has not entirely cleared off the whitening, patches are visible, with the aid of a magnifier, covered with very fine parallel grooves which are evidently impressions of the individual teeth. The outline of the imprint of the radula is also sometimes seen to be very minutely serrated. Another feature is observable, namely, the existence of short scratches in the whitening in advance of the point, varying from one to three in number. They greatly resemble, in miniature, the prints of animals' claws in snow.

The impressions of *Limax maximus* may be distinguished from those of *H. aspersa* in being smaller, more sharply pointed, and in the example exhibited they are more crowded, this however may not be a constant characteristic. The scratches also differ; I have not observed more than two in *Limax maximus*, and they are detached from the main impression, whereas in *H. aspersa* they are united to it and occasionally there are three. The detachment may possibly arise from the radula of the slug not having penetrated so deeply into the whitening as that of the snail; or the coat of whitening may be thicker or harder.

The following observers have recorded feeding-tracks of Gastropoda. Ebenezer Emmons in 1846 ('Agriculture of New York,' vol. i. p. 68, pl. xiv. fig. 1) described and figured some tracks on fine green slate which he at first mistook for fossils. Prof. E. B. Poulton in 1885 published an account ('Nature,' vol. xxxiii. p. 176) of snails eating the whitening upon a greenhouse roof. He did not see the animal at work, but thought it was almost certainly *Helix aspersa*. Mr. Woodworth in 1893 ('Science,' vol. xxi. p. 157) described some tracks of snails, of which he did not give the name, on carboniferous rock. Herr Rathay in 1898 ('Zeitschrift für Pflanzenkrankheiten,' B. viii. pp. 129-133) figured and described tracks made by *Helix hortensis* when feeding on *Pleurococcus vulgaris* growing on the bark of trees.

The most detailed account, however, is that of Mr. B. B. Woodward, in 1906 (Proc. Malac. Soc. March, p. 31, figs. 1 & 2), of impressions made by an unnamed slug upon an overexposed photographic print. The mollusc had eaten quite through the gelatine, exposing the white paper, which retained not only the coarser markings, but also the fine striæ made by the individual teeth similar to those referred to above. The figures of the tracks of this slug much more nearly resemble the tracks of *L. maximus* than of *H. aspersa*. I have not, however, seen any notice of the fine scratches.

Prof. Poulton suggested that snails eat the whitening on account of carbonate of lime being requisite for different parts of their

structure. Our gardener informs me that cats and dogs lick whitening off glass, apparently liking the paste employed in the mixtures; it is possible, therefore, that gasteropods may have a similar partiality. Moreover, the physiological need for carbonate of lime cannot be very great in the case of a slug.

[The panes of glass bearing the tracks have been placed in the Oxford University Museum.]

ADDITIONS AND DONATIONS

TO THE

LIBRARY.

1912-1913.

Acton (Elizabeth). *Botrydina vulgaris* Brébisson, a primitive Lichen. Pp. 7; with 1 plate and 3 text-figs. (Ann. Bot. xxiii.) 8vo. Oxford, 1909. **Author.**

Albert, Honoré Charles (*Prince de Monaco*). Résultats des Campagnes Scientifiques accomplies sur ses Yachts [l'Hirondelle et la Princesse-Alice]. Publiés sous sa Direction avec le concours de M. JULES RICHARD. Fascicules 1-41, 43.

4to. Monaco, 1889-1912.

XXXV. Poissons provenant des campagnes du Yacht Princesse-Alice (1901-1910). Par ERIC ZUGMAYER. Pp. 174; avec 6 planches. 1911.

XXXVI. Géphyriens (Sipunculides et Echiurides) provenant des Campagnes de la Princesse-Alice (1898-1910). Par G. P. SLUITER. Pp. 36; avec 1 planche. 1912.

XXXVII. Mollusques provenant des Campagnes de l'Hirondelle et de la Princesse-Alice dans les Mers du Nord. Par P. DAUTZENBERG et H. FISCHER. Pp. 627; avec 11 planches. 1912.

XXXVIII. Copépodes parasites des Poissons et des Échinides provenant des Campagnes Scientifiques de S.A.S. le Prince Albert 1^{er} de Monaco (1886-1910). Par ALEXANDRE BRIAN. Pp. 58; avec 12 planches. 1912.

XXXIX. Pyrosomes et Appendiculaires provenant des Campagnes de l'Hirondelle et de la Princesse-Alice (1885-1910). Pp. 38; avec 2 planches et 1 carte. 1912.

XL. Exploration du Nord-Ouest du Spitzberg entreprise sous les auspices de S.A.S. le Prince de Monaco par la Mission Isachsen. Première Partie. Par GUNNAR ISACHSEN. Pp. 112; avec 25 planches et 3 cartes. 1912.

XLI. Exploration du Nord-Ouest du Spitzberg entreprise sous les auspices de S.A.S. le Prince de Monaco par la Mission Isachsen. Deuxième Partie. Par GUNNAR ISACHSEN et ADOLF HOEL. Pp. 95; avec 25 planches. 1913.

XLIII. Exploration du Nord-Ouest du Spitzberg entreprise sous les auspices de S.A.S. le Prince de Monaco par la Mission Isachsen. Quatrième Partie. Par JAKOB SCHETELIG. Pp. 32; avec 2 planches. 1912.

XLIV. Exploration du Nord-Ouest du Spitzberg entreprise sous les auspices de S.A.S. le Prince de Monaco par la Mission Isachsen. Cinquième Partie. Par HANNA RESVOLL HOLMSEN. Pp. 80; avec 9 planches. 1913.

- Andrews (Charles William).** *See British Museum* (Nat. Hist.). A descriptive Catalogue of the Marine Reptiles of the Oxford Clay. Part II. Pp. xxiv, 206; with 12 plates and 73 text-figures. 4to. 1913.
- Arber (Agnes).** *Herbals, their Origin and Evolution: a Chapter in the History of Botany, 1470-1670.* Pp. xviii, 253; with 21 plates and 113 text-figs. 8vo. *Cambridge*, 1912. **Author.**
- Ascherson (Paul).** *See Muschler (Reno).* A Manual Flora of Egypt. 8vo. 1912.
- Ashworth (J. H.).** *See British Museum* (Nat. Hist.). *Vermes. Catalogue of the Chaetopoda in the British Museum* (Nat. Hist.). A. Polychæta: Part I.—Arenicolidæ. Pp. xii, 175; with 15 plates and 68 text-figures. 8vo. 1912.
- Atlas der Baumarten von Java.** *See S. H. Koorders und Th. Valetton.* 4to. 1913.
- Austen (Ernest E.).** *See British Museum* (Nat. Hist.). *Economic Series.* The House-fly as a Danger to Health: its Life-history and how to deal with it. Pp. 11; with 7 text-figs. 8vo. 1913.
- Bailey (Frederick Manson).** *Comprehensive Catalogue of Queensland Plants, both indigenous and naturalised [being a second Edition of the "Catalogue of the indigenous and naturalised Plants of Queensland"].* Pp. 879; with 16 plates and 976 figs. in the text. 8vo. *Brisbane* [1909-13]. **Author.**
- Baker (Richard Thomas) and Smith (Henry George).** A Research on the Eucalypts of Tasmania and their Essential Oils. Pp. 71; plates 4. (Papers & Proc. Roy. Soc. Tasmania, 1912.) 8vo. *Hobart*, 1913. **Authors.**
- Bastian (Henry Charles).** *The Origin of Life: being an Account of Experiments with certain superheated Saline Solutions in hermetically sealed vessels. Second Edition.* Pp. 98; with 12 plates. 8vo. *London*, 1913. **Author.**
- Benington (R. Crewdson).** *An Introduction to the Study of Cramometry, pointing out its Value in demonstrating the Origin and Evolution of the various Races of Men. Lecture delivered before the Hastings and St. Leonards Nat. Hist. Society, May 7th, 1907.* Pp. 14. 8vo. *Hastings*, 1907. **Thos. Parkin.**
- Berlin.**
- Das Tierreich.** Begründet von der Deutschen Zoologischen Gesellschaft. Im Auftrage der Königl. Preuss. Akademie der Wissenschaften zu Berlin, herausgegeben von FRANZ EILHARD SCHULZE. Liefg. 34-38. 8vo. *Berlin*, 1912-1913.
- Liefg. 34. *Lepidoptera. Rhopalocera. Amathusiidæ.* Von HANS STICHEL. Pp. xv, 248, mit 42 Abbildungen. 1912.
- „ 35. *Platyhelminthes. Turbellaria. II. Rhabdocelida.* Von LUDWIG VON GRAFF. Pp. xx, 484; mit 394 Abbildungen. 1913.
- „ 36. *Mollusca. Pteropoda.* Von JOHAN JACOB TESCH. Pp. xvi, 154; mit 108 Abbildungen. 1913.

- Liefg. 37. Amphibia. Gymnophiona (Amphibia apoda). Von FRIEDRICH NIEDEN. Pp. ix, 30; mit 20 Abbildungen. 1913.
 „ 38. Mollusca. Solenogastres. Von JOHANNES THIELE. Pp. x, 57; mit 28 Abbildungen. 1913.

Bibliotheca Botanica (*continued*). Heft 78–81.

4to. Stuttgart, 1913.

- Heft 78. PETRAK (FRANZ). Die Formenkreis des *Cirsium eriophorum* (L.), Scop. in Europa. Pp. 92; mit 35 Textabbildungen, 16 Tafeln, und 1 Verbreitungskarte. 1912.
 „ 79. MYLIUS (GEORG). Das Polyderm. Eine vergleichende Untersuchung über die physiologischen Scheiden. Polyderm, Periderm, und Endodermis. Pp. 119; mit 4 Tafeln. 1913.
 „ 80. FLEISCHER (MAX). Seltene sowie einige neue indische Archipelmosee nebst *Calymperopsis*, gen. nov. Pp. 11; mit 7 Tafeln. 1913.
 „ 81. GERRESHEIM (ÉDUARD). Ueber den anatomischen Bau und die damit zusammenhängende Wirkungsweise der Wasserbahnen in Fiederblättern der Dicotyledonen. Pp. 67; mit 7 Tafeln. 1913.

Blanford (William Thomas). The Fauna of British India, including Ceylon and Burma . . . Edited by W. T. BLANFORD (and Lieut.-Col. C. T. BINGHAM and ARTHUR E. SHIPLEY).

8vo. London, 1888–1912.

Diptera Nematocera (excluding Chironomidæ and Culicidæ). By ENRICO BRUNETTI. Pp. xxviii, 581; with 12 plates and 44 figs. in the text. 1912.

Hymenoptera.—Vol. III. Ichneumonidæ:—I. By CLAUDE MORLEY. Pp. xxxvi, 531; with 1 plate and 152 text-figs. 1913.

Börjesen (Frederik C. E.). The Marine Algæ of the Danish West Indies. Part I. Chlorophyceæ. Pp. 158; with a chart and 126 illustr. in the text. (Dansk Bot. Arkiv. i. Heft 4.)

8vo. Copenhagen, 1913. Author.

Bose (J. C.). An Automatic Method for the Investigation of Velocity of Transmission of Excitation in *Mimosa*. Pp. 34; 25 text-figures. (Phil. Trans. ser. B, vol. 204, pp. 63–97.)

4to. London, 1913.

Boulger (George Simonds). Plant Geography. Pp. viii, 136; with 16 illustrations.

8vo. London, 1912.

— Botany: Chapters on the Study of Plants. Pp. viii, 120; with 22 illustrations.

8vo. Halifax [1912]. Author.

Boullet (Eugène) and Cerf (F. le). Catalogue de la Collection de Lépidoptères du Muséum National d'Histoire Naturelle de Paris. I. Papilionidæ. Pp. iv, 47.

8vo. Paris, 1912→

Bournemouth.

Bournemouth Natural Science Society. Proceedings. Vol. IV.

8vo. Bournemouth, 1913. R. V. Sherring.

Brand (August). See Engler (H. G. A.). Das Pflanzenreich.

Heft 59. Hydrophyllaceæ.

8vo. 1913.

British Association for the Advancement of Science.Report (Portsmouth), 1911. 8vo. *London*, 1912.Report (Dundee), 1912. 8vo. *London*, 1913.**British Museum** (*continued*).

The History of the Collections contained in the Natural History Departments of the British Museum. Vol. II.—Appendix.

General History of the Department of Zoology from 1856–1895. By Dr. ALBERT GÜNTHER. Pp. ix, 109.

8vo. *London*, 1912.

MAMMALS.

Catalogue of the Mammals of Western Europe (Europe exclusive of Russia) in the Collection of the British Museum. By GERRIT S. MILLER. Pp. xv, 1019; with 213 text-figures. 8vo. *London*, 1912.Catalogue of the Heads and Horns of Indian Big Game, bequeathed by A. O. HUME, C.B., to the British Museum (Natural History). By R. LYDEKKER. Pp. xvi, 45; with 16 text-figures and Portrait. 8vo. *London*, 1913.

BIRDS.

Catalogue of the Collection of Birds' Eggs in the British Museum (Natural History). Vol. V. Carinatae (Passeriformes completed). By W. R. OGILVIE-GRANT. Pp. xxiii, 547; with 22 col. plates. 8vo. *London*, 1912.

INSECTS.

*Hymenopterous Insects.*A Revision of the Ichneumonidæ, based on the Collection in the British Museum (Natural History). With Descriptions of New Genera and Species.—Part II. Tribes Rhyssides, Ecthyromorphides, Anomalides, and Paniscides. By CLAUDE MORLEY. Pp. viii, 140; with 1 plate. 8vo. *London*, 1913.*Lepidopterous Insects.*Catalogue of the Lepidoptera Phalænæ. Vol. XII. Catalogue of the Noctuidæ in the Collection of the British Museum. By Sir GEORGE F. HAMPSON, Bart. Pp. xiii, 626; with 134 text-figures. 8vo. *London*, 1913.

VERMES.

Catalogue of the Chætopoda in the British Museum (Natural History). A. Polychæta: Part I.—Arenicolidæ. By J. H. ASHWORTH. Pp. xii, 175; with 15 plates and 63 text-figures. 8vo. *London*, 1912.

FOSSILS.

- A Descriptive Catalogue of the Marine Reptiles of the Oxford Clay. By CHARLES WILLIAM ANDREWS. Part II. Pp. xxiv, 206; with 12 plates and 73 text-figures.

4to. *London*, 1913.

ECONOMIC SERIES.

- I. The House-fly as a Danger to Health: its Life-history and how to deal with it. By ERNEST E. AUSTEN. Pp. 11; with 7 text-figures.

8vo. *London*, 1913.

GUIDE-BOOKS.

- Guide to the Specimens illustrating the Races of Mankind (Anthropology). Second Edition. By R. LYDEKKER. Pp. 35; illustrated by 16 figures.

8vo. *London*, 1912.

- Guide to the Domesticated Animals (other than Horses). Second Edition. By R. LYDEKKER. Pp. vi, 56; illustrated by 25 figures.

8vo. *London*, 1912.

- Britton (Nathaniel Lord). North-American Trees, being descriptions of the Trees growing independently of Cultivation in North America, North of Mexico, and the West Indies. With the Assistance of JOHN ADOLPH SHAFER. Pp. x, 894; with 781 illustr.

4to. *London*, 1908.

- Brockmann-Jerosch (Henryk) and Rübel (Eduard). Die Einteilung der Pflanzengesellschaften nach ökologisch-physiognomischen Gesichtspunkten. Pp. vi, 72; mit 1 textfiguren.

8vo. *Leipzig*, 1912.

- Brunetti (Enrico). See Blanford (W. T.). The Fauna of British India, including Ceylon and Burma. Diptera Nematocera (excluding Chironomidæ and Culicidæ).

8vo. 1912.

- Buchegger (Josef). Beitrag zur Systematik von *Genista Hassertiana*, *G. holopetala*, und *G. radiata*. Pp. 32; mit 11 textfiguren und 1 Verbreitungskarte. (Oester. bot. Zeitschr., Jahrg. 62, 1912.)

8vo. *Wien*, 1912. Author.

- Calonne (Charles Alexander de). Museum Calonnianum. Specification of the various articles consisting of subjects in Entomology, Conchology, Ornithology, Mineralogy, &c. [By GEORGE HUMPHREYS.] Part I. Pp. viii, 84.

[Sale Catalogue.]

4to. *London*, 1797.

- Cerf (F. le). See Boulet (Eugène). Catalogue de la Collection de Lépidoptères du Museum National d'Histoire Naturelle de Paris. I. Papilionidæ.

8vo. *Paris*, 1912.

- Chapman (Frederick). Note on the Occurrence of some Sepias new or little known to the Victorian Coast. Pp. 3; with 1 plate. (Field Nat. Club Victoria, xxix.)

8vo. *Melbourne*, 1912.

- Chapman (Frederick).** What are Type specimens? How should they be named? Pp. 6. (Field Nat. Club Victoria, xxix.)
8vo. Melbourne, 1912.
- Report on a Collection of Lower Ordovician Fossils. Pp. 4; with 2 plates. (Rec. Geol. Surv. Victoria, iii. part 2.)
8vo. Melbourne, 1912.
- Reports on Ordovician Fossils. Pp. 2. (Rec. Geol. Surv. Victoria, iii. part 2.)
8vo. Melbourne, 1912.
- Silurian and Devonian Fossils from the Mitta Mitta District. Pp. 3; with 4 plates. (Rec. Geol. Surv. Victoria, iii. part 2.)
8vo. Melbourne, 1912.
- Reports on Fossils (Middle Devonian of the Buchan District).—Pp. 6; with 4 plates. (Rec. Geol. Surv. Victoria, iii. part 2.)
8vo. Melbourne, 1912.
- Note on the Correlation of Tasmanian and Victorian Jurassic Strata. Preliminary Note on the fossiliferous rocks of Limestone Creek, North-East Victoria. Pp. 2. (Rec. Geol. Surv. Victoria, iii. part 2.)
8vo. Melbourne, 1912.
- Newer Silurian Fossils of Eastern Victoria. Part II. Pp. 10; with 2 plates. (Rec. Geol. Surv. Victoria, iii. part 2.)
8vo. Melbourne, 1912.
- Report on Jurassic and Carboniferous Fish Remains. Pp. 3; with 1 plate. (Rec. Geol. Surv. Victoria, iii. part 2.)
8vo. Melbourne, 1912.
- On the Occurrence of *Scaldicetus* in Victoria. Pp. 3; with 1 plate. (Rec. Geol. Surv. Victoria, iii. part 2.)
8vo. Melbourne, 1912. **Author.**
- Christensen (Carl).** A Monograph of the Genus *Dryopteris*. Part I. The Tropical American Pinnatifid-bipinnatifid Species. Pp. 230; with 46 text-figs. (Kgl. Danske Vid. Selsk. Skrifter, 7 Række, Nat. x. n. 2.)
4to. København, 1913.
- Christ-Socin (Hermann).** Die illustrierte spanische Flora des CARL CLUSIUS vom Jahre 1576. Pp. 23. (Oester. bot. Zeitschr., Jahrg. 62.)
8vo. Wien, 1912. **Author.**
- Chun (Carl).** Festschrift C. CHUN zum 60. Geburtstage, 1. Oktober, 1912, gewidmet. (Zoologica, xxvi. Heft 67ⁿ.)
4to. 1913.
- Clinton-Baker (H.).** Illustrations of Conifers. Vols. 1-3.
4to. Hertford, 1909-13.
- Cogniaux (Alfred).** La botanique en Belgique pendant le dernier demi-siècle 1862-1912. Pp. 46. (Bull. Soc. Roy. Bot. Belg. 2 Ser. i. Jubilaire vol.)
4to. Bruxelles, 1912. **Author.**
- Coutinho (Antonio Xavier Pereira).** A Flora de Portugal (Plantas Vasculares). Pp. 769.
8vo. Lisboa, &c., 1913.
- Dahl (Maria).** See **Plankton-Expedition** der Humboldt-Stiftung. Band ii. Lief. 1. Die Copepoden der Plankton-Expedition. I. Die Corycaeninen. Mit Berücksichtigung aller bekannten Arten. Pp. iv, 134; mit 16 Tafeln.
4to. 1912.

Danish (The) Ingolf-Expedition (*continued*).

Vol. iii. part 3.

4to. *Copenhagen*, 1913.**Druce (George Claridge)**. Linnæus, "Flora Anglica." Pp. 8.
(Reprinted from *Scottish Bot. Review*, July 1912.)8vo. *Edinburgh*, 1912.— **Northamptonshire Botanologia**. JOHN CLARE. Pp. 32;
with 2 plates. (*Journ. Northampt. Nat. Hist. Soc.* xxvi.)8vo. *Northampton*, 1912. **Author**.— *See Gregory (Mrs. E. S.)*. *British Violets*. 8vo. 1912.
Dublin.**Department of Agriculture and Technical Instruction for
Ireland**. Fisheries Branch.

Scientific Investigations, 1912, Nos. 1, 2, & 3.

8vo. *Dublin*, 1913. **Author**.**Edinburgh**.**Royal Botanic Garden**.

Notes, nos. 32–36.

8vo. *Edinburgh*, 1912–1913.— List of Seeds collected in the Royal Botanic Gardens,
Edinburgh, during the Year 1912. 8vo. *Edinburgh*, 1912.**I. Bayley Balfour**.**Elgee (Frank)**. *The Moorlands of North-Eastern Yorkshire:
their Natural History and Origin*. Pp. xvi, 361; with 71
illustrations and 3 maps. 8vo. *London*, 1912. **Author**.**Elliot (Daniel Giraud)**. *A Review of the Primates*. (*American
Museum of Natural History. Monographs.*) 3 vols.4to. *New York*, 1912–1913.

Vol. I. Lemuroidea—Anthropoidea. Pp. cxxvi, 317, Index xxxviii.

II. Anthropoidea (*continued*). Pp. xviii, 382, Index xxvi.III. Anthropoidea (*concluded*). Pp. xiv, 262, Index clxviii.**Elwes (Henry John) and Henry (Augustine)**. *The Trees of
Great Britain and Ireland*. Vols. 7.4to. *Edinburgh*, 1906–1913. **H. J. Elwes**.

I. Pp. xvi, 200; plates 1–60. 1906.

II. „ vi, 201–450; plates 58 *a*, 61–126; plate 27 of vol. I. 1907.

III. „ vi, 451–711; plates 120, 127–207. 1908.

IV. „ viii, 713–1000; plates 208–270. 1909.

V. „ viii, 1001–1333; plates 271–339. 1910.

VI. „ vi, 1335–1651; plates 340–371. 1912.

VII. „ viii, 1653–1933 } plates 372–412. 1913.
„ xxiv, 1935–2022 }**Engler (Heinrich Gustav Adolf)**. *Das Pflanzenreich. Regni
Vegetabilis conspectus . . . Herausgegeben von A. ENGLER*.
Heft 56–59. 8vo. *Leipzig*, 1912–1913.Heft 56. KRÄNZLEIN (FRITZ). *Cannaceæ*. Pp. 77; mit 80 Einzel-
bildern in 16 Figuren. 1912.„ 57. PAX (FERDINAND). *Euphorbiaceæ — Acalyphææ — Chrozo-
phorinæ*, unter Mitwirkung von KÄTHE HOFFMANN. Pp. 142;
mit 116 Einzelbildern in 25 Figuren. 1912.„ 58. GRÜNING (G.). *Euphorbiaceæ — Porantheroideæ et Ricino-
carpoideæ (Euphorbiaceæ — Stenolobææ)*. Pp. 97; mit 89
Einzelbildern in 16 Figuren. 1913.„ 59. BRAND (A.). *Hydrophyllaceæ*. Pp. 210; mit 178 Einzel-
bildern in 39 Figuren. 1913.

- Evans (Arthur Humble).** *See Fryer (Alfred).* The Potamogetons (Pond Weeds) of the British Isles. 4to.
- Field (Henry, the late).** Memoirs of the Botanic Garden at Chelsea belonging to the Society of Apothecaries of London. Revised, corrected, and continued to the present time, by R. H. SEMPLE. Pp. 272; portrait, view, and 3 plans. 8vo. London, 1878.
- Field Club (The);** being the Transactions of the Birmingham Field Naturalists' Club. Edited by HERBERT THOMPSON. Vol. I. Nos. 1 & 2 (Sept. 1909, and Mar. 1910.) [All issued.] 8vo. Birmingham, 1909-10. **Dr. B. Daydon Jackson.**
- Fleischer (Max).** Seltene sowie einige neue indische Archipelmoose nebst *Calymperopsis*, gen. nov. Pp. 11; mit 7 Tafeln. (Bibl. Bot. Heft 80.) 4to. Stuttgart, 1913.
- Flora Italica Cryptogama.** Pars III.: Lichenes. Auctore ANTONIO JATTA. Pp. xxii, 958; with 80 figs. in the text. 8vo. Rocca San Casciano, 1909-1911.
- Forest Bulletin.** Nos. 16-29. 8vo. Calcutta, 1913.
- Franz (V.).** Sehorgan. *See Oppel (Albert).* Lehrbuch der vergleichenden mikroskopischen Anatomie der Wirbeltiere. Pp. x, 417; mit 431 Textabbildungen. 8vo. 1913.
- Fries (Theodor Magnus).** Iter Lapponicum. Andra upplagan med bilagor och noter. Pp. xi, 268; illustrated. (*See Linné, Carl von.* Skrifter utgifna af Kungl. Svenska Vetenskaps-Akademien, V.) 8vo. Uppsala, 1913. **Author.**
- Froggatt (Walter Wilson).** Pests and Diseases of the Coconut Palm. Pp. 47; with 8 plates and 10 illustrations. (Dept. Agric. N.S.W., Sci. Bull. no. 2.) 8vo. Sydney, 1912.
- Presidential Address, delivered Wednesday, March 27th, 1912. Pp. 43. (Proc. Linn. Soc. N.S.W. vol. 37, pt. 5.) 8vo. Sydney, 1912. **Author.**
- Fryer (Alfred) and Evans (Arthur Humble).** The Potamogetons (Pond Weeds) of the British Isles; with descriptions of all the species, varieties, and hybrids. Parts 10-12. Pp. 57-76; plates 37-49. 4to. London, 1912.
- Fuhrmann (Franz).** Vorlesungen über technische Mykologie. Pp. viii, 454; mit 140 Abbildungen im Text. 8vo. Jena, 1913.
- Garden (The).** Vol. 76. 4to. London, 1912. **Editor.**
- Gardener's Chronicle.** 3 ser., vols. 51, 52. fol. London, 1912. **Editor.**
- Gerresheim (Eduard).** Ueber den anatomischen Bau und die damit zusammenhängende Wirkungsweise der Wasserbahnen in Fiederblättern der Dicotyledonen. Pp. 67; mit 7 Tafeln. (Bibl. Bot. Heft 81.) 4to. Stuttgart, 1913.
- Gibbs (Arthur Ernest).** Butterfly-hunting in the Balkans. Pp. 16; 2 plates. (Entomologist, March, April, May, 1913.) 8vo. London, 1913.
- Graff (Ludwig von).** *See Berlin.* Das Tierreich. Liefg. 35. Platyhelminthes, Turbellaria. II. Rhabdocoelida. Pp. xx, 484; mit 394 Abbildungen. 8vo. 1913.

- Grant (William Robert Ogilvie).** *See British Museum* (Nat. Hist.). Birds. Catalogue of the Collection of Birds' Eggs in the British Museum (Natural History). Vol. V. Pp. xxiii, 547; with 22 col. plates. 8vo. 1912.
- Greene (Edward Lee).** CAROLUS LINNAEUS. With an Introduction by BARTON WARREN EVERMANN. Pp. 91. With Portrait. 8vo. *Philadelphia*, 1912. **J. N. Rose.**
- Gregory (Mrs. Eliza Sanderick).** British Violets. A Monograph. With an Introduction by GEORGE CLARIDGE DRUCE. Pp. xxiii, 108; with 34 illustrations. 8vo. *Cambridge*, 1912.
- Grüning (G.).** *See Engler (H. G. A.).* Das Pflanzenreich. Heft 58. Euphorbiaceae—Porantheroideae et Ricinocarpoideae (Euphorbiaceae—Stenolobeae). 8vo. 1913.
- Günther (Albert Carl Ludwig Gotthilf).** *See British Museum* (Nat. Hist.). The History of the Collections contained in the Natural History Department of the British Museum. Pp. ix, 109. 8vo. 1912.
- Gunning (J. W. B.) and Haagner (Alwin).** A Check-List of the Birds of South Africa. Pp. 86. (Ann. Transv. Mus., Suppl. ii. July 1910.) 8vo. *Pretoria*, 1910.
- Guppy (Henry Brougham).** Studies in Seeds and Fruits. Pp. xii, 528; illustrated. 8vo. *London*, 1912.
- Haagner (Alwin).** *See Gunning (J. W. B.).* A Check-List of the Birds of South Africa. 8vo. 1910.
- Hampson (Sir George Francis, Bt.).** *See British Museum* (Nat. Hist.). Lepidopterous Insects. Catalogue of the Lepidoptera Phalænæ. Vol. XII. Pp. xiii, 626; with 134 text-figures. 8vo. 1913.
- Hampstead.**
Hampstead Scientific Society.
 Reports 1911, 1912. 8vo. *Hampstead*, 1911–13.
Hugh Findon.
- Hampstead Heath: its Geology and Natural History.** Prepared under the Auspices of the Hampstead Scientific Society. Pp. 328; with 3 maps and 11 plates. 8vo. *London*, 1913.
H. Findon on behalf of the Hampstead Scientific Society.
- Hansen (Hans Jacob).** Crustacea Malacostraca. (II.) *See Danish (The) Ingolf-Expedition.* Vol. III. Part 3. 4to. 1913.
- Hansen-Ostenfeld (Carl).** De Danske Farvandes Plankton i Aarene 1898–1901. Phytoplankton og Protozoer. I. Phytoplanktonets Livskaar og Biologi, samt de i vore Farvande iagttagne phytoplanktonarters optræden og forekomst. Pp. 362; with 9 text-figures. (K. Dansk. Vid. Selsk. Skrifter, 7 Række, ix. 2.) 4to. *Köbenhavn*, 1913.
- Hartog (Marcus Manuel).** Problems of Life and Reproduction. Pp. xx, 362; with 1 plate and 41 text-figures. 8vo. *London*, 1913. **Author.**

- Hayata (Bunzo).** *Icones Plantarum Formosanarum nec non et Contributiones ad Floram Formosanam.*
 Fasc. I. Pp. 265, with 40 plates.
 „ II. Pp. 156, with 41 plates.
 4to. *Taihoku*, 1911-1912. **Kakichi Uchida.**
- Headley (Frederick W.).** *Life and Evolution.* Pp. xx, 272;
 with 1 plate and 98 text-figures.
 8vo. *London*, 1913. **Duckworth & Co.**
- Henry (Augustine).** *See* **Elwes (Henry John).** *The Trees of Great Britain*, 7 vols. 4to. 1906-13.
- Herdman (William Abbott).** *Spolia Runiana. I.*
 8vo. *London*, 1913. **Author.**
- Hermann (Friedrich).** *Erlangen. Beiträge zur Kenntnis der südamerikanischen Dipterenfauna auf Grund der Sammelergebnisse einer Reise in Chile, Peru und Bolivia, ausgeführt in den Jahren 1902-1904 von W. SCHNITSE. Fam. Asilidae.* Pp. 275: mit 5 Tafeln und 57 Figuren im Texte. (*Nova Acta*, Bd. 96, 1912.) 4to. *Halle a./S.*, 1912.
- Hoel (Adolf).** *Exploration du Nord-Ouest du Spitzberg entreprise sous les auspices de S.A.S. le Prince de Monaco par la Mission Isachsen. Deuxième partie. See Albert, fasc. 41.*
- Hoffmann (Käthe).** *See* **Engler (H. G. A.).** *Das Pflanzenreich.* Heft 57. *Euphorbiaceæ—Acalyphææ—Chrozophorinæ.*
 8vo. 1912.
- Hollrung (Max).** *See Jahresbericht über die Neuerungen und Leistungen auf dem Gebiete des Pflanzenschutzes* 8vo.
- Holmsen (Hanna Resvoll).** *Exploration du Nord-Ouest du Spitzberg entreprise sous les auspices de S.A.S. le Prince de Monaco par la Mission Isachsen. Cinquième partie. See Albert, fasc. 44.*
- Hopkinson (John).** *A Bibliography of the Tunicata, 1469-1910.* Pp. xii, 288. (*Ray Society.*) 8vo. *London*, 1913.
- Horst (Rutger).** *See Siboga-Expeditie.* *Polychæta errantia of the Siboga Exped. Part I. Amphinomidæ. Monogr. xxiv: a.*
- [Humphrey (George).]** *Museum Calonnianum. Specification of the various articles which compose the . . . Museum of Natural History collected by M. de CALONNE in France, &c. (Pt. 1.) See Calonne (C. A. de).* 4to. 1797.
- Isachsen (Gunnar).** *Exploration du Nord-Ouest du Spitzberg entreprise sous les auspices de S.A.S. le Prince de Monaco par la Mission Isachsen. See Albert, fasc. 40, 41.*
- Izuka (Akira).** *The Errantiate Polychæta of Japan.* Pp. 262: with 25 plates. (*Journ. Coll. Sci. Imp. Univ. Tokyo*, xxx., Art. 2.) 4to. *Tokyo*, 1912.
- Jackson (Benjamin Daydon).** *Index to the Linnean Herbarium, with indication of the Types of Species marked by CARL von LINNÉ.* Pp. 152. (*Forming a Suppl. to Proc. Linn. Soc. 124th Session, 1911-12.*) 8vo. *London*, 1912. **Author.**

- Jackson (H. Gordon).** *Eupagurus*. Pp. viii. 79: plates 6. See Liverpool Marine Biology Committee. Memoir xxi. 1913.
- Jahrbuch der landwirtschaftlichen Pflanzen- und Tierzüchtung.** Herausgegeben von Dr. ROBERT MÜLLER. Jahrgang i., ii. 8vo. Stuttgart, 1904-05.
- Jahresbericht über die Neuerungen und Leistungen auf dem Gebiete des Pflanzenschutzes.** Herausgegeben von Dr. MAX HOLLBUNG. Bd. iii. 8vo. Berlin, 1902.
- Janchen (Erwin).** Zur Benennung der europäischen Farne. Pp. 2. (Mitt. Nat. Ver. Univ. Wien, Jahrg. x., 1912.) 8vo. Wien, 1912.
- Die Anwendung der Komplementbindungsmethode zur Ermittlung natürlicher Verwandtschaft von Tieren und Pflanzen. Pp. 3. (Mitt. Nat. Ver. Univ. Wien, Jahrg. x., 1912.) 8vo. Wien, 1912.
- Die Methoden der Biologischen Eiweissdifferenzierung in ihrer Anwendung auf die Pflanzensystematik. Pp. 20. (Mitt. Nat. Ver. Univ. Wien, Jahrg. xi., 1913.) 8vo. Wien, 1913. Author.
- Janet (Charles).** *Le Volvox*. Pp. 151: avec 15 figs. dans le texte. 8vo. Limoges, 1912. Author.
- Jatta (Antonio).** See *Flora Italica Cryptogama*. Pars iii. Lichenes. 8vo. Rocca San Casciano, 1909-1911.
- Jonsson (Helgi).** The Marine Algae of Iceland. I-IV. (Bot. Tidskr. xxiv., xxv.) 8vo. Copenhagen, 1901-1903.
- The Marine Algae of East Greenland. Pp. 73: with 13 text-figs. (Meddelelser om Grønland, xxx.) 8vo. Copenhagen, 1904. F. H. Sikes.
- Journal of Botany.** Vol. 50. 8vo. London, 1912.
- Kershaw (Edith M.).** Structure and Development of the Ovale of *Bowenia spectabilis*. Pp. 22: with 1 plate, and 16 figures in the text. (Ann. Bot. xvi. n. 103.) 8vo. Oxford, 1912. Author.
- Kindberg (Nils Conrad).** Svensk Flora: beskrifning öfver Sveriges Fanérogamer och Ormbunkar. Pp. 402. 8vo. Linköping, 1877. Univ. Uppsala.
- Koorders (S. H.).** Atlas der Baumarten von Java. Zusammen- gestellt von S. H. KOORDERS und THEODORIC VALETON. Heraus- gegeben von S. H. KOORDERS. Lieferungen 1-3. 4to. Leiden, 1913.
- Kränzlein (Fritz).** See Engler (H. G. A.). Das Pflanzenreich. Heft 56. Cannaceæ. 1912.
- Lang (William Henry).** See Strasburger (Eduard) and others. Text-Book of Botany. Third English Edition. 8vo. 1908.
- Le Cerf (F.).** See Bouillet (Eugène). Lepidoptères.
- Lecomte (Henry).** Flore Générale de L'Indo-Chine. Vol. I. 8vo. Paris, 1907-1912.
- Linné (Carl von).** Skrifter af Carl von Linné utgifna af Kungl. Svenska Vetenskaps-akademien. V. Iter Lapponicum. Andra upplagan med bilagor och noter ombesörjd af Th. M. FRIES. Pp. xi, 268: illustrated. 8vo. Uppsala, 1913. Univ. of Uppsala.

Linnés Föreläsningar öfver Djurriket. *See* Lönnerberg (A. J. E.).
 Liverpool.

Liverpool Marine Biology Committee.

Memoirs on Typical British Marine Plants and Animals.

Edited by W. A. HERDMAN. I-XXI.

8vo. *Liverpool*, 1889-1913.

XXI. *Eupagurus*. By H. GORDON JACKSON. Pp. viii, 79; with
 6 plates. 1913.

Loder (Sir Edmund Giles, Bt.). List of Trees and Shrubs grown
 in the open air at Leonardslee, Horsham. Pp. 123.

8vo. *London*, 1913. **Author.**

Lönnerberg (Axel Johan Einar). Linnés Föreläsningar öfver
 Djurriket med af Svenska Statsunderstöd för Uppsala Uni-
 versitet utgifna. Pp. xiii, 607.

8vo. *Uppsala*, 1913. **Univ. of Uppsala.**

London.

Royal Society of London.

Catalogue of Periodical Publications in the Library. Pp. viii,
 455. 4to. *London*, 1912.

South Eastern Union of Scientific Societies. *See* South Eastern
 Union, etc. 8vo. 1913.

Lydekker (Richard). *See* British Museum (Nat. Hist.). Guide-
 Books. Guide to the Specimens illustrating the Races of
 Mankind (Anthropology). Second Edition. Pp. 35; with 16
 figures. 8vo. 1912.

— Guide to the Domesticated Animals (other than Horses).
 Second Edition. Pp. vi, 50; with 25 figures. 8vo. 1912.

— *See* British Museum (Nat. Hist.). Mammals.
 Catalogue of the Heads and Horns of Indian Big Game
 bequeathed by A. O. HUME to the Brit. Mus. (Nat. Hist.).
 Pp. xvi, 45; with 16 text-figures and Portrait. 8vo. 1913.

Lyne (Robert Nunez). *Hevea*: Yields of some Henaratgoda
 Trees. Pp. 12; 2 figures. (Dept. Agric. Ceylon, Bulletin
 No. 4, pp. 73-91.) 8vo. *Colombo*, 1913.

Macvicar (Symers Macdonald). The Student's Handbook of
 British Hepatics, with illustrations by H. G. JAMESON. Pp.
 xxiii, 463; with 273 illustrations.

8vo. *Eastbourne and London*, 1912.

Maiden (Joseph Henry). A Critical Revision of the Genus
Eucalyptus. Parts 16, 17. 4to. *Sydney*, 1912. **Author.**

Man (Johannes Govertus de). *See* Siboga-Expeditie. Livr. lxix.
 The Decapoda of the Siboga Expedition. Pt. I, Suppl.
 Penæidæ. 4to. 1913.

Miller (Gerrit S.). *See* British Museum (Nat. Hist.). Mammals.
 Catalogue of the Mammals of Western Europe (Europe
 exclusive of Russia) in the Collection of Brit. Mus. Pp. xv,
 1019; with 213 text-figs. 8vo. 1912.

Mitsukuri (K.). Studies on Actinopodous Holothurioidea.
 Pp. 284; with 8 plates, and 55 figs in the text. (Journ. Coll.
 Sci. Imp. Univ. Tokyo, xxix. Art. 2.) 4to. *Tokyo*, 1912.

- Monckton (Horace Woollaston).** On some Valleys, Terraces and Moraines in the Bergen District, Norway. Pp. 20; with 5 plates and 6 text-figures. (Proc. Geol. Assoc. xxiv. Part 1.)
8vo. *London*, 1913.
- On the Hafslo Lake and the Solvorn Valley (Norway). Pp. 8; with 1 plate and 2 text-figures. (Quart. Journ. Geol. Soc. vol. 69.)
8vo. *London*, 1913. **Author.**
- Morley (Claude).** See **Blanford (W. T.).** The Fauna of British India, including Ceylon and Burma. Hymenoptera.—Vol. iii. Ichneumonidæ:—I. Ichneumonones Deltoidei.
8vo. 1913.
- See **British Museum (Nat. Hist.).** Hymenopterous Insects. A revision of the Ichneumonidæ, based on the Collection in the Brit. Mus. (Nat. Hist.). With descriptions of New Genera and Species. Part II. Pp. viii, 140; with 1 plate.
8vo. 1913.
- Mortensen (Theodor).** See **Danish Ingolf-Expedition.** Vol. V. Part 2. Ctenophora.
4to. 1912.
- Morton (Friedrich).** Die Bedeutung der Ameisen für die Verbreitung der Planzensamen. Pp. 32; mit 1 Tafel. (Mitt. Nat. Ver. Univ. Wien, Jahrg. x., 1912.)
8vo. *Wien*, 1912. **Author.**
- Moss (Charles Edward).** Vegetation of the Peak District. Pp. x, 235; 1 Map, and 36 figs. in the text.
8vo. *Cambridge*, 1913.
- Müller (Robert).** See **Jahrbuch der landwirtschaftlichen Pflanzen- und Tierzüchtung.**
8vo.
- Murray (James).** Notes on the Natural History of Bolivia and Peru. Including a Report on the Rhizopoda, by G. H. WAILES. Pp. 45; with 17 text-figs. (Scottish Oceanographical Laboratory.)
8vo. *Edinburgh*, 1913. **Jas. Murray.**
- Muschler (Reno).** A Manual Flora of Egypt, with a Preface by PAUL ASCHERSON and GEORG SCHWEINFURTH. 2 vols.
8vo. *Berlin*, 1912.
- I. Pp. ix, 1-672. II. Pp. 673-1312.
- Mylius (Georg).** Das Polyderm. Eine vergleichende Untersuchung über die physiologischen Scheiden Polyderm, Periderm und Endodermis. Pp. 119; mit 4 Tafeln. (Bibl. Bot. xviii. Heft 79.)
4to. *Stuttgart*, 1913.
- New Orleans.**
Louisiana State Museum.
Biennial Report III. 8vo. *New Orleans, La.*, 1913.
- New York.**
American Museum of Natural History. Monographs.
ELLIOT (DANIEL GIRAUD). A Review of the Primates.
3 vols. 4to. *New York*, 1912-1913.
- Vol. I. Lemuroidea—Anthropoidea. Pp. cxxvi, 317, Index xxxviii.
„ II. Anthropoidea (continued). Pp. xviii, 382, Index xxvi.
„ III. Anthropoidea (concluded). Pp. xiv, 262, Index clxviii.

- Nieden (Friedrich).** See **Berlin.** Das Tierreich. Liefg. 37. Amphibia. Gymnophiona (Amphibia Apoda). 8vo. 1913.
- North (Alfred J.).** Nests and Eggs of Birds found breeding in Australia and Tasmania. Vol. IV. Part II. (Australian Museum, Special Catalogue No. 1; 2nd ed. Cat. No. xii, entirely rewritten, with additions.) Pp. 97-200; Pls. B, xix. 8vo. *Sydney*, 1913.
- Oliver (Francis Wall).** Makers of British Botany; a Collection of Biographies by Living Botanists. Edited by F. W. O. Pp. 332; with 27 plates and 1 fig. in the text. 8vo. *Cambridge*, 1913.
- Oppel (Albert).** Lehrbuch der vergleichenden mikroskopischen Anatomie der Wirbeltiere. 8vo. *Jena*, 1913.
- VII. Sehorgan von V. FRANZ. Pp. 417; mit 431 Textabbildungen. 1913.
- Parkin (Thomas).** The Great Auk. Pp. 36; with 5 plates. (Journ. Hastings & East Sussex Nat. vol. i. part 6.) 8vo. *Hastings*, 1911. **Author.**
- Pax (Ferdinand).** See **Engler (H. G. A.).** Das Pflanzenreich. Heft 57. Euphorbiaceæ—Acalyphææ—Chrozophorinæ. 1912.
- Penzance.**
Penzance Natural History and Antiquarian Society.
 Report and Transactions 1880-1885. 8vo. *Plymouth*, 1880-85. **Clement Reid.**
- Petrak (Franz).** Der Formenkreis des *Cirsium eriophorum* (L.) Scop. in Europa. Pp. 92; mit 35 Abbildungen, 6 Tafeln und 1 Verbreitungskarte (Bibl. Bot. Heft 78.) 4to. *Stuttgart*, 1912.
- Phillips (E. P.)** A Note on the Principal Systematic Work and Publications dealing with the South African Proteaceæ. Pp. 8. (Trans. Roy. Soc. S. Africa, ii. pt. 3.) 8vo. *Cape Town*, 1912. **Author.**
- Ray Society.** *Publications* (continued).
HOPKINSON (JOHN). A Bibliography of the Tunicata, 1469-1910. Pp. xii, 288. 8vo. *London*, 1913.
SCOTT (THOMAS & ANDREW). The British Parasitic Copepoda. Vol. II. Copepoda Parasitic on Fishes. Plates 1-72. 8vo. *London*, 1913.
- Reid (Clement).** Submerged Forests. Pp. 129; 1 pl. & 4 figures. 8vo. *Cambridge*, 1913.
- Retzius (Gustaf).** Biologische Untersuchungen. Neue Folge XVII. fol. *Stockholm & Jena*, 1912. **Author.**
- Ridley (Henry Nicholas).** New Plants from Sarawak. Pp. 9. (Sarawak Mus. Journ. vol. i. no. 2.) 8vo. *Sarawak*, 1912. **Author.**
- Rignano (Eugenio).** L'Évolution du Raisonnement. 1^{re} Partie. Du raisonnement concret au raisonnement abstrait. Pp. 23. (Scientia, vol. xiv. 7^{me} Ann. N. xxx-4, pp. 44-67.) 8vo. *Bologna*, 1913.

- Ross (Hermann).** Die Pflanzengallen (Cecidien) Mittel und Nordeuropas, ihre Erreger und Biologie und Bestimmungstabellen. Pp. viii, 350; mit 233 Figuren auf 10 Tafeln nach der Natur gezeichnet von Dr. G. DUNZINGER, und 24 Abbildungen im Text. 8vo. *Jena*, 1911.
- Roth (August).** Das Murgtal und die Flumseralpen. Inaugural-Dissertation. Pp. 283; mit 8 Tafeln und 1 Karte. (Jahrb. St. Gallischen Nat. Ges. 1912.) 8vo. *St. Gallen*, 1912.
Dr. Hans Schinz.
- Rübel (Eduard).** See **Brockmann-Jerosch (Henryk).** Die Einteilung der Pflanzengesellschaften nach ökologisch-physiognomischen Gesichtspunkten. 8vo. 1912.
- Sampaio (Gongalo).** Lista das Espécies representadas no Herbário Portugê. Pteridófitas e Spermáfitas. Pp. 148. 8vo. *Oporto*, 1913. **Author.**
- Sars (George Ossian).** An Account of the Crustacea of Norway, with short descriptions and figures of all the species. Vol. VI. Copepoda Cyclopoida. Pts. I. & II. Oithonidæ, Cyclopinidæ, Cyclopidæ (part). Roy. 8vo. *Bergen*, 1913.
- Scherdlin (Paul).** Ueber die Abnahme der verwilderten Tauben am Strassburger Münster. Pp. 92. 8vo. *Colmar*, 1913.
Author.
- Scherren (Henry).** The Zoological Society of London: a Sketch of its Foundation and Development and the Story of its Farm, Museum, Gardens, Menagerie, and Library. Pp. xii, 252; with 62 plates. 8vo. *London*, 1905.
- Schetelig (Jakob).** Exploration du Nord-Ouest du Spitsberg. 4^e partie. See **Albert**, fasc. 43. 4to. 1912.
- Schweinfurth (Georg).** See **Muschler (Reno).** A Manual Flora of Egypt. 2 vols. 8vo. 1912.
- Sclater (Philip Lutley).** Guide to the Gardens of the Zoological Society of London. Fiftieth Edition. 8vo. *London*, 1896. **W. Whitaker.**
- Scott (Andrew).** See **Scott (Thomas).** The British Parasitic Copepoda. Vols. I., II. (Ray Soc.) 8vo. *London*, 1913.
- Scott (Thomas) and Scott (Andrew).** The British Parasitic Copepoda. Vols. I., II. I. Copepoda Parasitic on Fishes. Pp. ix, 256; with plates A, B; plates 72. 8vo. *London*, 1913.
- Seemple (Robert Hunter).** See **Field (Henry).** Memoirs of the Botanic Gardens at Chelsea belonging to the Society of Apothecaries of London. 8vo. 1878.
- Shafer (John Adolph).** See **Britton (Nathaniel Lord).** North American Trees. 4to. 1908.
- Sherring (Richard Vowell).** *Spartina Townsendi*, H. & J. Groves. Intermediate Cord Grass. P. 1; with 2 plates. (Proc. Bournemouth Nat. Sci. Soc. iv.) 8vo. *Bournemouth*, 1910. **Author.**

- Siboga-Expeditie.** Livr. 62-69. 4to. *Leiden*, 1912-13.
Dr. Max Weber.
- Smith (Edward).** *The Life of Sir JOSEPH BANKS.* Pp. xvi, 348;
 with a photogravure and 16 other illustrations.
 8vo. *London*, 1911. *Dr. B. Daydon Jackson.*
- Smith (Henry George).** *See Baker (Richard Thomas).* A
 Research on the Eucalypts of Tasmania and their essential oils.
- Smith (Sir James Edward).** *The English Flora.* 4 vols.
 2nd ed. 8vo. *London*, 1828-1830.
- South Eastern Union of Scientific Societies** (*continued*).
The South Eastern Naturalist; being the Transactions of the
 South Eastern Union of Scientific Societies for 1913.
 8vo. *London*, 1913. *H. Norman Gray.*
- Stapf (Otto).** *The rapid spread of the Rice or Cord Grass (Spartina)*
and its value as a land builder on the Hampshire and Dorset
coasts. Lecture given at the Bournemouth Nat. Sci. Society,
Saturday, February 1st, 1913. (Bournemouth Guardian:
cutting.) 1913.
- Stichel (Hans).** *See Berlin.* *Das Tierreich.* Liefg. 34. Lepi-
 doptera Rhopalocera. Amathusiidæ. 8vo. 1912.
- Swainson (William).** *A Treatise on Malacology; or the Natural*
Classification of Shells and Shell Fish. Pp. viii, 419; figs. 130.
 8vo. *London* [1830]. *Miss Mary Rathbone.*
- *The Elements of modern Conchology; with definitions of*
all the Tribes, Families, and Genera, Recent and Fossil.
 Pp. viii, 62. 8vo. *London*, 1835.
- Tansley (Arthur George).** *Types of British Vegetation, by*
Members of the Central Committee for the Survey and Study
of British Vegetation. Edited by A. G. TANSLEY. Pp. xx,
 416; with 36 plates and 21 figures in the text.
 8vo. *Cambridge*, 1911.
- Tesch (Johan Jacob).** *See Berlin.* *Das Tierreich.* Liefg. 36.
 Mollusca: Pteropoda. 8vo. 1913.
- Thiele (Johannes).** *See Berlin.* *Das Tierreich.* Liefg. 38.
 Mollusca: Solenogastres. Pp. x, 57; mit 28 Abbildungen.
 8vo. 1913.
- Thoday (formerly Sykes) (Mary Gladys).** *The Anatomy and*
Morphology of the Inflorescences and Flowers of Ephedra.
 Pp. 33; with 1 plate and 21 text-figs. (*Ann. Bot.* xxvi.)
 8vo. *Oxford*, 1912. *Author.*
- Thompson (Herbert).** *See Field Club (Birmingham).*
 8vo. 1909-10.
- Timirjazew (Kliment Arkadijewitsch) and others.** *In Memory*
of CHARLES DARWIN (in Russian). Pp. 220; with 4 plates.
 8vo. *Moscow*, 1910. *Sir William T. Thiselton-Dyer.*
- Tobler (Friedrich).** *Die Gattung Hedera. Studien über Gestalt*
und Leben des Efeus, seine Arten und Geschichte. Pp. iv,
 151; mit 57 Abbildungen. 8vo. *Jena*, 1912.

- Truffaut (Georges).** Les Ennemis des Plantes Cultivées. Maladies-Insectes. Première Edition. Pp. 565; avec illustrations. 8vo. *Paris*, 1912.
- Turner (Frederick).** Mexican or Prickly Poppy. A noxious Weed. (*Sydney Morning Herald*, Saturday, Sept. 14, 1912.)
 — Cape Spinach. An Obnoxious Plant. (*Sydney Morning Herald*, Saturday, December 7, 1912, p. 27.)
 — Australia's Greatest Crop. (*Daily Telegraph*, Sydney, Thursday, March 20, 1913.)
 — Horse Nettle, or Sand Briar. A proclaimed Weed Pest. (*Sydney Morning Herald*, Saturday, June 14, 1913, p. 20.)
Sydney, 1913. **Author.**
- United States Geological Survey** (*continued*).
 Monographs. Vol. 51. 2 Parts. 4to. *Washington*, 1912.
 Vol. 51. Cambrian Brachiopoda. By CHARLES D. WALCOTT. 1912.
 I. Pp. 872. II. Pp. 363; plates 104.
- Valeton (Theodoric).** See **Koorders (S. H.).** Atlas der Baumarten von Java. 4to. 1913.
- Vejdovsky (Franz).** Zum Problem der Vererbungsträger. Pp. iv, 184; mit 12 Tafeln und 16 Textfiguren. fol. *Prag*, 1911-12. **Author.**
- Voeltzkow (Alfred).** Reise in Ostafrika in den Jahren 1903-1905. Vol. III. Heft 3. 4to. *Stuttgart*, 1913.
- Wacker (Hermann).** Physiologische und morphologische Untersuchungen über das Verblühen. Inaugural-Dissertation. Pp. 57; with 3 plates and 5 illustrations in Text. (Pringsh. Jahrb. wiss. Bot. Bd. 49.) 8vo. *Leipzig*, 1911.
- Wager (Harold W. T.).** On the Effect of Gravity upon the Movements and Aggregation of *Euglena viridis*, Ebreub., and other Micro-Organisms. Pp. 58; with 5 plates and 3 text-figs. (Phil. Trans. B. vol. 201.) 4to. *London*, 1911. **Author.**
- Wailles (George Herbert).** See **Murray (James).** Notes on the Natural History of Bolivia and Peru. Report on the Rhizopoda, pp. 31. 4to. *Edinburgh*, 1913.
- Walcott (Charles D.).** Cambrian Brachiopoda. 2 Parts. (U. S. Geol. Surv., Monog. 51, Parts 1, 2.) 4to. *Washington*, 1912.
 I. Pp. 872.
 II. Pp. 363; with 104 plates.
- Warming (Johannes Eugenius Bülow).** Dansk Plantevækst. Andet Hæftbind. 8vo. *Köbenhavn og Kristiania*, 1909. **Author.**
- Watson Botanical Exchange Club.**
 Annual Report, 28th. 8vo. *Cambridge*, 1913. **G. Goode.**
- Weber (Max).** See **Siboga-Expeditie.** Livr. 65. Die Fische der Siboga-Expedition. 4to. 1913.
- Wood (John Medley).** Addendum to revised List of the Flora of Natal. Pp. 14. (Trans. Roy. Soc. S. Africa, iii. part 1.) 8vo. *Cape Town*, 1913. **Author.**

Yapp (Richard Henry). *Spiraea Ulmaria*, L., and its Bearing on the Problem of Xeromorphy in Marsh Plants. Pp. 56; with 3 plates and 11 text-figs. (Ann. Bot. xxvi.)

8vo. Oxford, 1912. Author.

Yorkshire Naturalists' Union.

The Naturalist: a monthly illustrated Journal of Natural History for the North of England, for 1910.

8vo. London, 1910. Dr. B. Daydon Jackson.

Zoologica (*continued*).

Band XXVI. Heft 67II. Festschrift CARL CHUN zum 60. Geburtstage, 1. Oktober 1912, gewidmet. Pp. 212-550; mit 9 Tafeln, 6 Karten und 103 Textfiguren. 1913.

Zoological Record. Vol. 48 (1911).

8vo. London, 1913.

BENEFACTIONS.

LIST *in accordance with Bye-Laws, Chap. XVII. Sect. 1, of all Donations of the amount or value of Twenty-five pounds and upwards.*

1790.

The Rt. Hon. Sir Joseph Banks, Bt.

Cost of Copper and engraving of the plates of the first volume of Transactions, 20 in number.

The same: Medallion of C. von Linné, by C. F. Inlander.

1796.

The same: a large collection of books.

1800.

Subscription towards the Charter, £295 4s. 6d.

Claudius Stephen Hunter, Esq., F.L.S. (Gratuitous professional services in securing the Charter).

1802.

Dr. Richard Pulteney.

His collections, and £200 Stock.

Aylmer Bourke Lambert, Esq.

Portrait of Henry Seymer.

1804.

The Rt. Hon. Sir Joseph Banks, Bt.

His collection of Insects.

1807.

Richard Anthony Salisbury, Esq.

Portrait of Daniel Solander, by J. Zoffany.

1811.

The Rt. Hon. Sir Joseph Banks, Bt.

His collection of Shells.

Mrs. Pulteney.

Portrait of Dr. R. Pulteney, by S. Beach.

1814.

Joseph Sabine, Esq.

Portrait of C. von Linné, after A. Roslin, reversed.

Dr. John Sims.

Portrait of Dr. Trew.

1818.

Subscription of £215 6s. for Caley's Zoological Collection.

1819.

The Medical Society of Stockholm.

A medallion of Linnæus in alabaster.*

1822.

Bust of Sir Joseph Banks, Bt., by Sir F. Chantrey, R.A.
Subscription of the Fellows.

1825.

The late Natural History Society.

£190, 3½ Stock.

Bust of Sir James Edward Smith, P.L.S., by Sir F. Chantrey, R.A., by Subscribers.

1829.

Subscription for the purchase of the Linnean and Smithian Collections, £1593 8s.

1830.

Sir Thomas Grey Cullum, Bt.
£100 Bond given up.

1832.

The Honourable East India Company.
East Indian Herbarium (Wallichian Collection).

1833.

Subscription for Cabinets and mounting the East Indian Herbarium, £315 14s.

1835.

Subscription portrait of Robert Brown, by H. W. Pickersgill, R.A.

1836.

Subscription portrait of Edward Forster, by Eden Upton Eddis.
Subscription portrait of Archibald Menzies, by E. U. Eddis.

1837.

Subscription portrait of Alexander MacLeay, by Sir Thomas Lawrence, P.R.A.

1838.

Collections and Correspondence of Nathaniel John Winch.
Portrait of Dr. Nathaniel Wallich, by John Lucas, presented by Mrs. Smith, of Hull.

1839.

Subscription portrait of William Yarrell, by Mrs. Carpenter.

1842.

David Don: herbarium of woods and fruits.
Archibald Menzies: bequest of £100, subject to legacy duty.
Portrait of John Ebenezer Bicheno, by E. U. Eddis, presented by Mr. Bicheno.

1843.

Subscription in aid of the funds of the Society, £994 3s.
Subscription portrait of Sir William Jackson Hooker, by S. Gambardella.

1845.

Microscope presented by Subscribers.

1846.

Joseph Janson: £100 legacy, free of duty, and two cabinets.

1847.

[Bequest of £200 in trust, by Edward Rudge; declined for reasons set forth in Proceedings, i. pp. 315-317.]

1849.

Portrait of Sir J. Banks, Bt., by T. Phillips, R.A., presented by Capt. Sir E. Home, Bt., R.N.

1850.

Subscription portrait of the Rt. Rev. Edward Stanley, D.D., Bishop of Norwich, by J. H. Maguire.

1853.

Portrait of Carl von Linné, after A. Roslin, by L. Pasch, presented by Robert Brown.

Pastel portrait of A. B. Lambert, by John Russell, presented by Robert Brown.

1854.

Professor Thomas Bell, £105.

1857.

Subscription portrait of Prof. T. Bell, P.L.S., by H. W. Pickersgill, R.A.

Thomas Corbyn Janson: two cabinets to hold the collection of fruits and seeds.

Pleasance, Lady Smith: Correspondence of Sir J. E. Smith, in 19 volumes.

1858.

Subscription portrait of Nathaniel Bagshaw Ward, by J. P. Knight.

Richard Horsman Solly, £90 after payment of Legacy Duty.

Subscription for removal to Burlington House, £1108 15s.

Biography of Carl von Linné, and letters to Bishop C. F. Mennander, presented by Miss Wray.

Dr. Horsfield's Javan plants, presented by the Court of Directors of the Hon. East India Company.

Dr. Ferdinand von Mueller's Australian and Tasmanian plants, including many types.

1859.

Books from the library of Robert Brown, presented by J. J. Bennett, Sec.L.S.

Robert Brown: bequest of two bonds given up, £200.

1861.

Subscription bust of Robert Brown, by Peter Slater.

Collection of birds' eggs, bequeathed by John Drew Salmon, F.L.S.

1862.

The Linnean Club: presentation bust of Prof. T. Bell, by P. Slater.

1863.

Subscription portrait of John Joseph Bennett, by E. U. Eddis.

1864.

Beriah Botfield, Esq.: Legacy, £40 less Duty.

1865.

Executors of Sir J. W. Hooker, £100.

George Bentham, Esq.: cost of 10 plates for his "Tropical Leguminosæ," Trans. vol. xxv.

1866.

Dr. Friedrich Welwitsch: Illustrations of his 'Sertum Angolense,' £130.

1867.

George Bentham, Esq.: General Index to Transactions, vols. i.-xxv.
Royal Society: Grant in aid of G. S. Brady on British Ostracoda, £80.

1869.

Carved rhinoceros horn from Lady Smith, formerly in the possession of Carl von Linné.

1874.

Subscription portrait of George Bentham, by Lowes Dickinson.
George Bentham, Esq., for expenditure on Library, £50.

1875.

Legacy from James Yates, £50 free of Duty.
„ „ Daniel Hanbury, £100 less Duty.

1876.

Legacy of the late Thomas Corbyn Janson, £200.

„ „ „ Charles Lambert, £500.

George Bentham, Esq.: General Index to Transactions, vols. xxvi.-xxx.

1878.

Subscription portrait of John Claudius Loudon, by J. Linnell.

Subscription portrait of Rev. Miles Joseph Berkeley, by James Peel.

1879.

Rev. George Henslow and Sir J. D. Hooker: Contribution to illustrations, £35.

1880.

The Secretary of State for India in Council: cost of setting up Dr. Aitchison's paper, £36.

1881.

George Bentham, Esq., special donation, £25.

The same: towards Richard Kippist's pension, £50.

Portrait of Dr. St. George Jackson Mivart, by Miss Solomon; presented by Mrs. Mivart.

1882.

Executors of the late Frederick Currey: a large selection of books. Subscription portrait of Charles Robert Darwin, by Hon. John Collier.

The Secretary of State for India in Council: Grant for publication of Dr. Aitchison's second paper on the Flora of the Kurrum Valley, £60.

1883.

Sir John Lubbock, Bt. (afterwards Lord Avebury).

Portrait of Carl von Linné, ascribed to M. Hallman.

Philip Henry Gosse, Esq.: towards cost of illustrating his paper, £25.

Royal Society: Grant in aid of Mr. P. H. Gosse's paper, £50.

Sophia Grover, Harriet Grover, Emily Grover, and Charles Ehret Grover: 11 letters from Carl von Linné to G. D. Ehret.

1885.

Executors of the late George Bentham, £567 11s. 2d.

Subscription portrait of George Busk, by his daughter Marian Busk.

1886.

A large selection of books from the library of the late Dr. Spencer Thomas Cobbold (a bequest for a medal was declined).

Sir George MacLeay, Bt.: MSS. of Alexander MacLeay and portrait of Rev. William Kirby.

1887.

William Davidson, Esq.: 1st and 2nd instalments of grant in aid of publication, £50.

Francis Blackwell Forbes, Esq., in aid of Chinese Flora, £25.

1888.

The Secretary of State for India in Council: Grant in aid of publication of results of the Afghan Boundary Delimitation Expedition, £150.

Dr. J. E. T. Aitchison, towards the same, £25.

Trustees of the Indian Museum: Mergui Archipelago report, for publication in Journal, £135.

Dr. John Anderson, for the same, £60.

Wm. Davidson, Esq.: 3rd and last instalment, £25.

Sir Joseph Hooker: (1) Series of medals formerly in possession of George Bentham; (2) Gold watch, key, and two seals belonging to Robert Brown.

1889.

Bronze copy of model for Statue of C. von Linné, by J. F. Kjellberg ;
presented by Frank Crisp, Esq.

1890.

The Secretary of State for India in Council : Grant for Delimitation
Expedition report, £200.

Oak table for Meeting Room, presented by Frank Crisp, Esq.

Subscription portrait of Sir Joseph Dalton Hooker, K.C.S.I., by
Hubert Herkomer, R.A.

Executors of the late John Ball, Esq. : a large selection of books.

An anonymous donor, £30.

Colonel Sir Henry Collett, K.C.B., towards the publication of his
Shan States collections, £50.

1891.

Subscription portrait of Sir John Lubbock, Bt. [Lord Avebury]
by Leslie Ward.

George Frederick Scott Elliot, Esq., towards cost of his Madagascar
paper, £60.

1892.

Dr. Richard Charles Alexander Prior : for projection lantern, £50.

1893.

The Executors of Lord Arthur Russell : his collection of portraits
of naturalists.

Electric light installation : cost borne by Frank Crisp, Esq.

1894.

Algernon Peckover, Esq. : Legacy, £100 free of Duty.

Miss Emma Swan : " Westwood Fund," £250.

1896.

Clock and supports in Meeting Room, presented by Frank Crisp,
Esq.

1897.

William Carruthers, Esq. : Collection of engravings and photo-
graphs of portraits of Carl von Linné.

Royal Society : Grant towards publication of paper by the late
John Ball, £60.

Subscription portrait of Professor George James Allman, by
Marian Busk.

1898.

Sir John Lubbock, Bt. : Contribution towards his paper on
Stipules, £43 14s. 9d.

Royal Society : Contribution towards F. J. Cole's paper, £50.

" " " " Murray & Blackman's paper,
£80.

" " " " Elliot Smith's paper, £50.

" " " " Forsyth Major's paper, £50.

1899.

A. C. Harmsworth, Esq. [Lord Northcliffe]: Contribution towards cost of plates, £43.

Royal Society: Contribution towards Mr. R. T. Günther's paper on Lake Urmi, £50.

1901.

Hon. Charles Ellis, Hon. Walter Rothschild, and the Bentham Trustees: The Correspondence of William Swainson.

Royal Society: Contribution towards Mr. F. Chapman's paper on Funafuti Foraminifera, £50.

Prof. E. Ray Lankester: Contribution towards illustration, £30 5s. Portrait of Dr. St. G. J. Mivart, presented by Mrs. Mivart.

1903.

Royal Society: Contribution toward Dr. Elliot Smith's paper, £50. Legacy from the late Dr. R. C. A. Prior, £100 free of duty.

Mrs. Sladen: Posthumous Portrait of the late Walter Percy Sladen, by H. T. Wells, R.A.

B. Arthur Bensley, Esq.: Contribution to his paper, £44.

1904.

Royal Society: Grant in aid of third volume of the Chinese Flora, £120.

Supplementary Royal Charter: cost borne by Frank Crisp, Esq. (afterwards Sir Frank Crisp).

1905.

Royal Society: First grant in aid of Dr. G. H. Fowler's 'Biscayan Plankton,' £50.

Executors of the late G. B. Buckton, Esq.: Contribution for colouring plates of his paper, £26.

1906.

Royal Society: Second grant towards 'Biscayan Plankton,' £50.

Subscription portrait of Prof. S. H. Vines, by Hon. John Collier.

Royal Swedish Academy of Science: Copies of portraits of C. von Linné, after Per Krafft the elder, and A. Roslin, both by Jean Haagen.

1907.

Royal University of Uppsala: Copy by Jean Haagen of portrait of C. v. Linné, by J. H. Scheffel (1739).

Royal Society: Third and final grant towards 'Biscayan Plankton,' £50.

The Trustees of the Percy Sladen Memorial Fund: First grant towards publication of Mr. Stanley Gardiner's Researches in the Indian Ocean in H.M.S. 'Sealark,' £200.

1908.

Prof. Gustaf Retzius: Plaster cast of bust of Carl von Linné, modelled by Walther Runeberg from the portrait by Scheffel

(1739) at Linné's Hammarby : the bronze original designed for the façade of the new building for the Royal Academy of Science, Stockholm.

Miss Sarah Marianne Silver, F.L.S. : Cabinet formerly belonging to Mr. S. W. Silver, F.L.S.

1909.

The Trustees of the Percy Sladen Memorial Fund : Second grant towards publication of Mr. Stanley Gardiner's *Researches in the Indian Ocean* in H.M.S. 'Sealark,' £200.

Prof. James William Helenus Trail, F.R.S., F.L.S. : Gift of £100 in Trust, to encourage Research on the Nature of Proto-plasm.

1910.

Royal Society : Grant towards Dr. G. H. Fowler's paper on Biscayan Ostracoda, £50.

Sir Joseph Hooker : Gold watch-chain worn by Robert Brown, and seal with portrait of Carl von Linné by Tassie.

Prof. J. S. Gardiner : Payment in aid of illustrations, £35 0s. 6d.

Sir Frank Crisp : Donation in Trust for Microscopical Research, £200.

The Trustees of the Percy Sladen Memorial Fund : Third grant towards publication of Prof. Stanley Gardiner's *Researches in the Indian Ocean*, £200. (For third volume.)

1911.

The Trustees of the Percy Sladen Memorial Fund : Second Donation towards the publication of the third volume on the *Indian Ocean Researches*, £70.

The same : First Donation towards the fourth volume, £130.

1912.

The Indian Government : Contribution towards the illustration of Mr. E. P. Stebbing's paper on Himalayan *Chermes*, £46 15s. 2d.

The late Mr. Francis Tagart, £500 free of Legacy Duty.

The late Sir Joseph Dalton Hooker, O.M., G.C.S.I., £100 free of Legacy Duty.

The Trustees of the Percy Sladen Memorial Fund : Second Donation towards the publication of the fourth volume on the *Indian Ocean Researches*, £140.

The same : First Donation towards the fifth volume, £60.

1913.

Royal Society : Grant towards Dr. R. R. Gates's paper on Mutating *Oenotheras*, £60.

Sir Frank Crisp, Bt., Wallichian Cabinets, £50.

INDEX TO THE PROCEEDINGS.

SESSION 1912-1913.

Note.—The following are not indexed:—The name of the Chairman at each meeting; speakers whose remarks are not reported; and passing allusions.

- Abstracts of Papers, 69-72.
 Accounts, 22-24; laid before Anniversary Meeting, 20.
 Additions to the Library, 73-90.
 Address, Presidential, 25-45.
 Africa, *see* Baker, E. G., Fuller, Miss, Johnstone, Miss M. U.
Alchemilla vulgaris, Linn., series of forms of, exhibited (Salmon), 15.
 Algæ, Marine, collected in the Red Sea (Gibson and Knight), 12; —, Red Marine, from the Indian Ocean (van Bosse), 67.
Alnus sp., specimen exhibited, with catkins showing early discharge of pollen (Henderson), 9.
 America, *see* Wailes, G. H.
 Amphibia, Catalogue of Linnean specimens of (Jackson), 19 (Supplement).
 Anderson, Dr. T., Councillor retired, 25.
 Anniversary Meeting, 19-48.
 Anthribidæ of the Seychelles (Jordan), 19.
Aphareocaris, nom. nov., a genus of the Crustacean Family Sergestidæ (Calman), 68.
 Arachnida of the Seychelles (Hirst), 19.
 Arber, Dr. Agnes, Anatomical study of the cone-genus *Lepidostrobos*, 68.
 Ascherson, Prof. Dr. P. F. A., deceased, 20; obituary, 49-51.
 Auditors elected, 17, 18.
 Austin, B. J., deceased, 20; obituary, 51.
 Australia, *see* Fuller, Miss.
 Bagnall, R. S., Classification of the Order Symphyla, 16.
 Baines, Mrs. F., withdrawn, 21.
 Baker, E. G., African species of the genus *Crotalaria*, 68; on some British varieties of the Bee-Orchis, *Ophrys apifera*, Huds., 17.
 Balance Sheet, *see* Cash Statement.
 Banana, inflorescence exhibited (Rathbone), 8.
 Bancroft, Miss N., on some Indian Jurassic Gymnosperms, 3; *Rhexoxylon africanum*, a new Medullosean Stem, 11.
 Barber, Rev. H. B., elected, 10; proposed, 6.
 Bateman-Brown, A. W., deceased, 20.
 Bedford, E. J., Notes on two Orchids new to East Sussex, 3-5.
 Bee-Orchis, some of its British varieties (Baker), 17.
 Benefactions, 91-98.
 Bentinck, Count Wilhelm von, received Linnean Medal on behalf of Prof. Engler, 45.
 Bickford, E. J., elected, 2.
 Bigby, Miss G., admitted, 18; elected, 14; proposed, 11.
 Birthday congratulations to Dr. B. D. Jackson, 14; to Sir J. Kirk, 6.
 Black, J. E., admitted, 14; elected, 11; proposed, 8.
 Blackman, Prof. V. H., withdrawn, 21.
 Blaikie, J., deceased, 20; obituary, 52.
 Blatter, Prof. E., elected, 13; proposed, 10.
 Bosse, Mme. Weber-van, Red Marine Algæ from the Indian Ocean, 67.
 Botanical Secretary (Dr. O. Stapf), elected, 25.

- Bourne, Prof. G. C., elected Councillor and Secretary, 25; on the Hon. P. Methuen's visit to Madagascar in search of subfossil Lemnaceae, 8; exhibited humerus of an extinct tortoise from Madagascar, 11.
- Bouvier, Prof. E. L., Les Caridines des Seychelles, avec des observations sur leurs variations, 9.
- Brenchley, Dr. Winifred, On branching specimens of *Lyginodendron oldhamium*, Will., 19.
- British North Borneo, see Gibbs, Miss L. S.
- British plants, new varieties of (Dr. Moss), 68; — —, six new (Druce), 9.
- Brooks, A. J., proposed, 66.
- Brown, see also Bateman-Brown.
- Brown, J. M., admitted, 19.
- Browne, E. T., elected, 10; proposed, 6.
- Buckley, Sir E., deceased, 20.
- Bucknall, C., Revision of the Genus *Symphytum*, 68.
- Bullen, Rev. R. A., deceased, 20; obituary, 52.
- Burton, F. M., deceased, 20; obituary, 53.
- Calcareous sponges, see Sponges.
- Calman, Dr. W. T., elected Councillor, 25; on *Aphareocaris*, nom. nov., a genus of the Crustacean Family Sergestidae, 68.
- Campion, H., Odonata of the Seychelles, 9.
- Cape Verde Islands, see Pixell, Miss H. L. M.
- Caridines des Seychelles (Bouvier), 9.
- Cash Statement received and adopted, 20; as audited, 22-24.
- Catalogue of Linnean specimens of Amphibia, Insecta, and Testacea (Jackson), 1-44 (Supplement).
- Cavanagh, B. F., elected, 3; proposed, 1.
- Chandhuri, B. L., elected, 11; proposed, 8.
- Cheiranthus* "Harpur-Crewe," exhibited (Walker), 10.
- Chibber, H. M., Morphology and Histology of *Piper Beetle*, Linn., 7.
- Chipp, T. F., admitted, 3; elected, 2; exhibited African Mahogany bored by *Xylotrya* and of Mangrove bored by *Teredo* sp., 9.
- Clarke, Sir E., exhibited pages of MS. of Oliver Goldsmith's "History of the Earth," 20.
- Clarke, Miss M. U., exhibited specimens of "Nature Camera-work," 5.
- Clarke, W. E., withdrawn, 21.
- Classification of the Order Symphyla (Bagnall), 16.
- Cockayne, E. A., withdrawn, 21.
- Cornwallis, F. S. W., withdrawn, 21.
- Councillors elected and retired, 6, 25.
- Cox, Dr. J. C., deceased, 20; obituary, 53.
- Craven, A. E., elected, 2.
- Crisp, Sir F., appointed V.-P., 66; elected Councillor, 6, 25.
- Crossland, C., see Gibson, Prof. R. J. H., and Miss M. Knight.
- Crossman, A. F., name ordered to be removed from List, 21.
- Crotalaria*, African species of the Genus (Baker), 68.
- Daley, C., elected, 67; proposed, 19.
- Davey, F. H., withdrawn, 21.
- Davidson, J., elected, 6; proposed, 2.
- Deakin, R. H., Anatomy of the larva of *Phryganea stricta*, 11.
- Deaths recorded, 20.
- Decapoda, Pelagic, from the Indian Ocean (Kemp), 68.
- Dendy, Prof. A., Calcareous Sponges collected in the Indian Ocean, 16; Councillor retired, 25.
- Denny, Prof. A., communication by (Deakin), 11.
- Diazona violacea*, Savigny, see Herdman, Prof. W. A.
- Dinner, announcement, 67.
- Distant, W. L., on Rhynchota from the Seychelles: Heteroptera, 67.
- Donald, J., elected, 66; proposed, 17.
- Donations to Library, 73-90; — to the Society (1790-1913), 91-98.
- Druce, G. C., on six new British plants, 9.
- Druce, H., deceased, 20; obituary, 54.
- Dzungaria, see Price, M. P., and N. D. Simpson.
- East Indies, see Groom, Prof. P., and W. Rushton.
- Eaton, Rev. A. E., Ephemeridæ and Psychodidæ of the Seychelles, 9.
- Elections, number of, 21.
- Elodea canadensis*, Nutt., long-leaved form exhibited (Thomas), 8.
- Embia major*, sp. nov., from the Himalayas (Inms), 16.
- Engler, Prof. Dr. Adolf, Linnean Medal presented to, 45-48.
- Enock, F., showed lantern-slides illustrating British Mymaridæ, 1.
- Ephemeridæ of the Seychelles (Eaton), 9.

- Fasciated holly exhibited (Walker), 7.
 Feeding-tracks of Gasteropoda exhibited (Longstaff), 67, 70-72.
 Fellows deceased, 20; elected, 21; withdrawn, 21.
 Financial Statement, *see* Cash Statement.
 Foreign Members, deceased, 20; elected, 21; vacancy in List announced, 11.
 Fossorial wasp mimicked by a Reduviid bug and a Locustid, exhibited (Poulton), 66.
 Foster, N. H., elected, 2.
 Fox, Thomas, withdrawn, 21.
 Foxglove, example of synanthry in, exhibited (Longstaff), 66; —, spirally-twisted stems in, exhibited (Longstaff), 67.
 Fries, Prof. Dr. T. M., deceased, 20; obituary, 55-58.
 Fuller, Miss, exhibited water-colour drawings of Australian and Cape flowers, 68.
Funiculina quadrangularis (Pallas), *see* Herdman, Prof. W. A.
 Gardiner, Prof. J. S., Councillor retired, 25; communications by (Bouvier and others) 9, (Pixell and others) 19, (Weber-van Bosse) 66, (Needham and Distant) 67, (Kemp) 68; moved birthday congratulations to Dr. Jackson, 14.
 Garland, *see* Lester-Garland.
 Gasteropoda, their feeding-tracks exhibited (Longstaff), 67, 70-72.
 Gates, Dr. R. R., admitted, 9; elected, 3; proposed, 1; on Mutating *Oenotheras*, 1.
 General Secretary, Annual Report of, 20; election of (Dr. B. D. Jackson), 25.
 Gerard, Rev. J., deceased, 20; obituary, 58.
 Gibbs, Miss L. S., Flora and Plant-Formations of Kinabalu and the Highlands of B. N. Borneo, 66.
 Gibson, Prof. R. J. H., on *Mystropetalon*, Harv., 67.
 — and Miss M. Knight, on Marine Algæ coll. by Mr. O. Crossland in the Red Sea, 12.
 Gilchrist, Dr. J. D. F., Larval Stages of *Jasus lalandii* (Milne-Edwards), 16.
 Goldsmith, Oliver, pages of his MS. exhibited, 20.
 Green, Dr. J. R., withdrawn, 21.
 Groom, Prof. P., elected Auditor, 18; elected Councillor, 25.
 Groom, Prof. P., and W. Rushton, Structure of the Wood of E. Indian species of *Pinus*, 18.
 Grouvelle, A., Nitidulidæ, Heteroceridæ, of the Seychelles, 19.
 Groves, H., deceased, 20; obituary, 58.
Gypsina plana, Carter, from the Indian Ocean (Lindsay), 19.
 Haman, A. H., *see* Poulton, Prof. E. B.
 Harding, W. A., on a new Land Leech from the Seychelles (*Idiobdella seychellensis*), 9.
 Harrison, J., admitted, 18; elected, 8; proposed, 3.
 Hebrides, *see* Herdman, Prof. W. A.
 Hemsley, W. B., on the Genera *Radamæa*, Benth., and *Nesogenes*, A. DC., 12.
 Henderson, Dr. G., exhibited specimen of *Alnus* sp. showing early discharge of pollen, 9.
 Henslow, Rev. G., on Vegetable Mechanics, 2.
 Herbarium, *see* Wallichian Herbarium.
 Herdman, Prof. W. A., elected Councillor, 25; *Spolia Runiana*—I. *Funiculina quadrangularis* (Pallas) and the Hebridean *Diazona violacea*, Savigny, 5.
 Heteroptera, *see* Distant, W. L.
 Heteroceridæ of the Seychelles (Grouvelle), 19.
 Hibbert-Ware, Miss A., admitted, 6; elected, 3; proposed, 1.
 Hill, A. W., elected Auditor, 17; elected Councillor, 25.
 Hill, Prof. J. P., communication by (Wilsmore), 19.
 Himalayas, *see* Imms, Dr. A. D.
 Hindmarsh, W. T., deceased, 20; obituary, 59.
 Hirst, S., Report on the Arachnida of the Seychelles, 19.
 Hispinæ from the Seychelles (Maulik), 19.
 Histeridæ of the Seychelles (Scott), 66.
 Hooker, Sir Joseph, his legacy to be applied to the Sir Joseph Hooker Lecture Fund, 8.
 Hooker Lecture Fund, circular embodying scheme, 10.
 Hooper, C. H., Experiments on the Pollination of our Hardy Fruits, 6.
 Hopkinson, J., elected Auditor, 17.
 Hughes, J., deceased, 20.
 Hume, A. O., deceased, 20; obituary, 60.
 Humerus of an extinct tortoise from Madagascar exhibited (Bourne), 11.

- Idiobdella seychellensis*, gen. and sp. nov., from the Seychelles (Harding), 9.
- Ilex Aquifolium*, Linn., see Walker, A. O.
- Imms, Dr. A. D., on *Embia major*, sp. nov., from the Himalayas, 16.
- India, see Bancroft, Miss N.
- Indian Ocean, Calcareous sponges collected in the (Dendy), 16; *Gypsina plana*, Carter, from (Lindsay), 19; Pelagic Decapoda from (Kemp), 68; Polychata of the (Pixell), 19; Red Marine Algae from (Weber-van Bosse), 67.
- Insecta, Catalogue of Linnean specimens of (Jackson), 19-38. (Supplement).
- Jackson, Dr. B. D., birthday congratulations, 14; Catalogue of the Linnean specimens of Amphibia, Insecta, and Testacea; with additions to the 'Index to the Linnean Herbarium,' 1-46. (Supplement); elected Councillor and Secretary, 25.
- Janson, F. H., deceased, 20; obituary, 61.
- Jasus lalandii* (Milne-Edwards), its larval stages (Gilchrist), 16; specimens exhibited (Stebbing), 16.
- Johnson, N. M., withdrawn, 21.
- Johnson, Rev. W., withdrawn, 21.
- Johnston, Dr. T. H., admitted, 67.
- Johstone, Miss M. W., exhibited water-colour drawings of S. African plants, 5.
- Jones, D. A., withdrawn, 21.
- Jordan, Dr. K., Anthribidæ of the Seychelles, 19; on changes in Nomenclature of Lepidoptera proposed by Dr. Verity, 19.
- Jurassic Gymnosperms, on some Indian (Bancroft), 3.
- Keeble, Prof. F., elected Councillor, 25.
- Kemp, S., Pelagic Crustacea Decapoda from the Indian Ocean, 68.
- Kinabalu, its Flora and Plant-Formations (Gibbs), 66.
- Kirby, W. F., deceased, 20; obituary, 61.
- Kirk, Sir John, birthday congratulations, 6.
- Kloss, C. B., see Ridley, H. N.
- Knight, Miss M., see Gibson, Prof. R. J. H.
- Knipe, H. R., seconded vote of thanks for Address, 45.
- Lecture Fund, see Hooker Lecture Fund.
- Leech, a new, from the Seychelles (Harding), 9.
- Lemuroids, subfossil, Hon. P. Methuen's visit to Madagascar in search of (Bourne), 8.
- Lepidoptera, coloured lantern-slides of, exhibited (Poulton), 66.
- Lepidostrobos*, Anatomical study of the cone-genus (Arber), 68.
- Lester-Garland, L. V., withdrawn, 21.
- Librarian's report, 21.
- Library Additions, 73-90.
- Lindsay, Miss M., On *Gypsina plana*, Carter, 19.
- Linnean Herbarium Index, additions and corrections (Jackson), 45. (Supplement).
- Linnean Medal, recipient nominated, 18; presented to Prof. Adolf Engler, 45.
- Linnean specimens of Amphibia, Insecta, and Testacea, Catalogue of (Jackson), 1-44. (Supplement).
- Linnean Types of Palearctic Rhopalocera, their Revision (Verity), 11.
- Longstaff, Dr. G. B., elected, 67; proposed, 19.
- Longstaff, Mrs. J., exhibited example of synanthry in the Foxglove, 66; — Foxgloves with spirally-twisted stems, 67; — feeding-tracks of Gasteropoda, 67, 70-72.
- Lyginodendron oldhamium*, Will., branching specimens of (Brenchley), 19.
- Madagascar, see Bourne, Prof. G. C.
- Mahogany bored by *Xylotrya*, exhibited (Chipp), 9.
- Mangrove bored by *Teredo* sp., exhibited (Chipp), 9.
- Mann, Dr. H. H., communication by (Chibber), 7.
- Marine Algae, see Algae.
- Maulik, S., Hispinæ from the Seychelles, 19.
- Medal, Linnean, presented to Prof. Adolf Engler, 45.
- Medullosean Stem, see Bancroft, Miss.
- Meek, Prof. A., withdrawn, 21.
- Methuen, Hon. P., see Bourne, Prof. G. C.
- Minchin, Prof. E. A., elected Councillor, 25.
- Monckton, H. W., appointed V.-P., 66; elected Councillor and Treasurer, 25; exhibited *Sisyrinchium angustifolium*, Mill., from Dartford Heath,

- 66; reported purchase of books with income from Tagart Bequest, 1.
- Mongolia, *see* Price, M. P., and N. D. Simpson.
- Morgan, A. C. F., A Problem in Weismannism, 19, 69.
- Moss, Dr. C. E., admitted, 6; on new varieties of British plants, 68.
- Mount Menuang Gasing, Selangor, Collection of plants from (Ridley), 2.
- Mountmorres, Viscount, name ordered to be removed from List, 21.
- Mullan, J. P., elected, 13; proposed, 10.
- Musa sapientum*, Linn., inflorescence exhibited (Rathbone), 8.
- Mutating *Oenotheras* (Gates), 1.
- Mymaridæ, lantern-slides illustrating, shown (Enock), 1.
- Myrmeleonidæ from the Seychelles (Needham), 67.
- Mystropetalon*, Harv., on, (Gibson), 67.
- "Nature Camera work" (Clarke), 5.
- Needham, J. G., Myrmeleonidæ from the Seychelles, 67.
- Nesogenes*, A. DC., *see* Hemsley, W. B.
- Newman, L. F., admitted, 67; elected, 66; proposed, 18.
- Nigeria, Southern, *see* Rendle, Dr. A. B.
- Nitidulidæ of the Seychelles (Grouvelle), 19.
- Nomenclature of Lepidoptera, Changes proposed by Dr. Verity (Jordan), 19.
- Obituary Notices, 49.
- Odonata of the Seychelles (Campion), 9.
- Oenotheras*, Mutating (Gates), 1.
- Oke, Alfred W., elected Auditor, 17.
- Oldham, C., admitted, 65; elected, 17; proposed, 12.
- Oliver, Prof. F. W., elected Councillor, 25.
- Ophrys apifera*, Huds., *see* Baker, E. G.
- Orchids new to East Sussex (Bedford), 3-5; *see also* Bee-Orchis.
- Paine, S. G., withdrawn, 21.
- Paulson, R., admitted, 67; elected, 18; proposed, 14.
- Pea, Wild, crosses (Sutton), 10.
- Peck, A. E., elected, 3; proposed, 1.
- Pelagic Decapoda, *see* Decapoda.
- Pescott, E. E., proposed, 66.
- Phryganea stricta*, Anatomy of its larva (Deakin), 11.
- Pinus*, Structure of the Wood of E. Indian species (Groom and Rushton), 18.
- Piper Belle*, Linn., Morphology and Histology (Chibber), 7.
- Pixell, Miss H. L. M., Polychæta of the Indian Ocean and Cape Verde Islands, 19.
- Pollination of our Hardy Fruits, Experiments on (Hooper), 6.
- Poulton, Prof. E. B., appointed Vice-Presidents, 66; elected President and Councillor, 25; nominated Scrutineers, 21; on a remarkable American work upon Evolution and the Germ Theory of Disease (Presidential Address), 25-45; exhibited coloured lantern-slides of Lepidoptera *in situ*, by Mr. A. H. Haman, 66; exhibited a Fossorial wasp mimicked by a Reduviid bug and a Locustid, 66; on Prof. Dr. A. Engler's work, 45-48.
- Polychæta of the Indian Ocean and Cape Verde Islands (Pixell), 19.
- President elected, 25.
- Presidential Address, 25-45.
- Price, M. P., and N. D. Simpson, Account of the Plants coll. by Mr. M. P. Price in N.W. Mongolia and Chinese Dzungaria, 17.
- Pselaphidæ de l'Archipel des Seychelles (Raffray), 19.
- Psychodidæ of the Seychelles (Eaton), 9.
- Radamæa*, Benth., and *Nesogenes*, A. DC. (Hemsley), 12.
- Raffray, A., Pselaphidæ de l'Archipel des Seychelles, 19.
- Rathbone, Miss M., exhibited inflorescence of the banana, *Musa sapientum*, Linn., 8.
- Red Marine Algæ, *see* Algæ.
- Rendle, Dr. A. B., elected Councillor, 25; showed specimens and lantern-slides illustrating Mr. P. A. Talbot's coll. of Southern Nigerian plants, 2.
- Rhexoxylon africanum*, a new Medullosean Stem (Bancroft), 11.
- Rhizopoda, Freshwater, from North and South America (Wailles), 68.
- Rhopalocera, Palaearctic, Revision of Linnean Types (Verity), 11.
- Rhynchota from the Seychelles (Distant), 67.
- Rice, Wild, specimens exhibited (Stapf), 7.
- Ridewood, Dr. W. G., elected

- Councillor, 25; nominated Auditor, 7, — unable to serve, 18.
- Ridley, H. N., Councillor retired, 25; on a collection of plants from Mount Menuang Gasing, Selangor, made by Mr. C. B. Kloss, 2.
- Rushton, W., *see* Groom, Prof. P., and W. Rushton.
- Salmon, C. E., exhibited a series of forms of *Alchemilla vulgaris*, Linn., 15.
- Sands, W. N., elected, 2.
- Saunders, Miss E. R., elected Councillor, 25.
- Saunders, W., withdrawn, 21.
- Scott, Dr. D. H., appointed Scrutineer, 21; Councillor retired, 25.
- Scott, Hugh, Histeridæ of the Seychelles, 66.
- Scrutineers appointed, 21.
- Scully, Lt.-Col. J., deceased, 20.
- Secretaries elected, 25.
- Selangor, *see* Ridley, H. N.
- Seward, Prof. A. C., appointed, V.-P., 66; elected Councillor, 25.
- Sexual Characters, their Development and Inheritance (Smith), 13.
- Seychelles:—Anthribidæ (Jordan), 19; Arachnida (Hirst), 19; Caridines (Bouvier), 9; Ephemeridæ (Eaton), 9; Heteroceridæ (Grouvelle), 19; Heteroptera (Distant), 67; Hispinæ (Maulik), 19; Histeridæ (Scott), 66; Myrmeleonidæ (Needham), 67; Nitidulidæ (Grouvelle), 19; Odonata (Campion), 9; on a new Land Leech from (Harding), 9; Pselaphidæ (Raffray), 19; Psychodidæ (Eaton), 9; Rhynchota (Distant), 67.
- Shikotan, its Flora (Takeda), 18.
- Sikes, F. H., admitted, 6; elected, 3; proposed, 1.
- Simpson, N. D., *see* Price, M. P., and N. D. Simpson.
- Sisyrinchium angustifolium*, Mill., from Dartford Heath, exhibited (Monckton), 66.
- Sleeper, G. W., and his pamphlet on Evolution and the Germ Theory of Disease (Presidential Address), 25–45.
- Smart, F. G., deceased, 20; obituary, 62–64.
- Smith, G. Whitfield, name ordered to be removed from List, 21.
- Smith, Geoffrey, Development and Inheritance of Sexual Characters, 13.
- South Africa, *see* Johnstone, Miss M. W.
- Spartina* vegetation, lantern-slides of views of, shown (Stapf), 11.
- Special Meetings, 6, 15.
- Sphenopus marsupialis*, Note on (Wilsmore), 19.
- Spolia Runiana—I. *Funiculina quadrangularis* (Pallas) and the Hebridean *Diazona violacea*, Savigny (Herdman), 5.
- Sponges, Calcareous, coll. in the Indian Ocean (Dendy), 16.
- Stapf, Dr. O., elected Councillor and Secretary, 25; exhibited specimens of Wild Rice, 7; showed lantern-slides of views of *Spartina* vegetation, 11.
- Stayner, F. J., elected, 2.
- Stebbing, Rev. T. R. R., moved vote of thanks for Address, 45; showed specimens of the larval stages of *Jasus lalandii* (Milne-Edwards), 16.
- Stockdale, F. A., admitted, 2.
- Stuart, Mrs. C. U., elected, 3; proposed, 1.
- Sutton, A. W., Wild Pea crosses, 10.
- Sycamore, abnormal fruit of, exhibited (Turrill), 12.
- Symphyla, Classification of the Order (Bagnall), 16.
- Symphytum*, Revision of the Genus (Bucknall), 68.
- Synanthry in the Foxglove, example exhibited (Longstaff), 66.
- Tagart Bequest, purchase of books with income from, 1.
- Takeda, Dr. H., on the Flora of Shikotan, 18.
- Talbot, P. A., *see* Rendle, Dr. A. B.
- Tansley, A. G., withdrawn, 21.
- Taylor, H. E. Irving, admitted, 8; elected, 3; proposed, 1.
- Teredo*, sp., *see* Chipp, T. F.
- Testacea, Catalogue of Linnean specimens of (Jackson), 38–43 (Supplement).
- Thomas, Miss E. N., elected Councillor, 25.
- Thomas, Mrs. R. H., admitted, 19; elected, 17; proposed, 12.
- Thomas, J. T. N., exhibited a long-leaved form of *Elodea canadensis*, Nutt., 8.
- Thompson, Prof. D'Arey, withdrawn, 21.
- Tortoise, *see* Bourne, Prof. G. C.
- Toppin, Capt. S. M., elected, 3; proposed, 1.
- Treasurer elected (H. W. Monckton), 25.
- Turner, Sydney, appointed Scrutineer, 21.

- Turrill, W. B., exhibited an abnormal fruit of Sycamore, 12.
- Uppsala University, Resolution presenting certain papers to, passed, 15, 13.
- Vegetable Mechanics (Henslow), 2.
- Verity, Dr. R.. Revision of the Linnean Types of Palæretic Rhopalocera, 11; on his proposed changes in Nomenclature of Lepidoptera (Jordan), 19.
- Vice-Presidents appointed, 66.
- Vines, Prof. S. H., appointed Scrutineer, 21.
- Vöchting, Prof. Dr. H. von, elected Foreign Member, 18; proposed, 12.
- Wailes, G. H., Freshwater Rhizopoda from North and South America, 68.
- Walker, A. O., exhibited twig of fasciated holly, *Ilex Aquifolium*, 7; on *Cheiranthus* "Harpur-Crewe," 10.
- Walker, Comr. J. J., elected Councillor, 25.
- Wallichian Herbarium, Resolution transferring it to Kew, passed, 13, 15.
- Ware, *see* Hibbert-Ware.
- Water-colour drawings of Australian and Cape flowers exhibited (Fuller), 68; ——— of S. African plants exhibited (Johnstone), 5.
- Weber-van Bosse, Mme. A., Red Marine Algae from the Indian Ocean, 67.
- Weismannism, Problem in (Morgan), 19, 69.
- West, O., admitted, 18; elected, 13; proposed, 10.
- White, J., communication by (Bucknall), 68.
- Whitehead, Sir C., deceased, 20; obituary, 64.
- Whymer, R., elected, 13; proposed, 10.
- Wilsmore, Mrs. L. J., on *Sphenopus marsupialis*, 19.
- Withdrawals, 21.
- Woodward, Dr. A. S., appointed V.-P., 66; elected Councillor, 25.
- Xylotrya*, *see* Chipp, T. F.
- Zoological Secretary (Prof. G. C. Bourne) elected, 25.

ERRATUM.

Page 19, line 16, *for* Nitidulæ, Heterocidæ, *read* Nitidulidæ, Heteroceridæ.

CATALOGUE
OF THE
LINNEAN SPECIMENS
OF
AMPHIBIA, INSECTA, AND TESTACEA,
NOTED BY
CARL VON LINNÉ.

TRANSCRIBED AND CODIFIED
BY
BENJAMIN DAYDON JACKSON,
KNIGHT OF THE ROYAL SWEDISH ORDER OF THE POLAR STAR,
HON. PH.D., & A.M., UPSAL. ;
GENERAL SECRETARY OF THE LINNEAN SOCIETY OF LONDON.

Forming a Supplement to the Proceedings of the
Society for the 125th Session, 1912-13.

LONDON:
PRINTED FOR THE LINNEAN SOCIETY,
BURLINGTON HOUSE, PICCADILLY, W.,
BY TAYLOR AND FRANCIS, RED LION COURT, FLEET STREET.

1913.

CONTENTS.



	Page
Introduction	5
The Zoological Collections	7
Contributors to the Zoological Collections	9
Peculiar Marginal Signs employed	13
Bibliography	15
Amphibia	18
Insecta	19
Testacea.....	38
Lithophyta	43
Zoophyta	44
Additions and Corrections to the 'Index to the Linnean Herbarium'	45
Index	47

INTRODUCTION.

THE following pages may be regarded as a continuation of the 'Index to the Linnean Herbarium' issued with last year's 'Proceedings,' as it records the catalogues made by Linné of certain groups in the Animal Kingdom, which catalogues came to light during the preparation of the said 'Index' as mentioned on page 26 of that work.

B. DAYDON JACKSON.

October, 1913.

ZOOLOGICAL COLLECTIONS.

THE annotated copies whence the following catalogues are derived are, a copy of the tenth edition of the 'Systema Naturæ,' vol. i., in which Linné has marked his possession of specimens by an underscore, a dot, or a line below; these notes apply only to the Amphibia, pp. 197-214, Insecta, pp. 345-640, and Testacea, pp. 667-788. There is also an imperfect copy of the twelfth edition, in which the Insecta are partially noted in the same manner, and at a later date. An endeavour has been made to combine both fragmentary sets of annotations into one series, thus:—

Amphibia; only in ed. X., therefore about the year 1758.

Insecta; taken from ed. XII., about the year 1767, with references to the numbers of each; species in ed. X. placed within parentheses, following the specific names. As an instance this may be given:—

PHALAENA.

7. pavonia (6).

The meaning is, that *Phalaena pavonia* is No. 7 in Syst. Nat. ed. XII., but is No. 6 in Syst. Nat. ed. X. The entries are imperfectly given as may be seen by inspection; many are noted in ed. X. which are not marked in ed. XII.

Testacea, from ed. X.

The curious omissions readily noticeable in these lists may be accounted for by the marking being done from memory, and not checked from the objects in front of Linné. This has been alluded to in the previous work, *cf.* 'Proc.' 1911-12, Suppl. p. 8.

The collection was endangered in April 1766 by a fire which destroyed a large part of the town of Uppsala; Linné hastily removed his collections and books to a barn outside the town, and some time later, built for their reception a square, one-roomed building of stone, on a height behind his country-house at Hammarby, where no artificial light or fire was permitted. Here they underwent the opposite danger of damage by damp. Less than two years before his death, Linné, on the 2nd of March, 1776, wrote some memoranda relative to his cabinets in which he says:—"The insect cabinet cannot long be kept because of moth"; and soon after the younger Linné had become possessed of them, we find

him saying, "that mice had done horrible damage to the plants, and that moth and mould had caused considerable damage," and to avoid further loss he was hard at work from morning to night, so that by the evening he was as tired as a labourer. The remaining collections which might take harm by damp in the little stone house, such as Zoophytes and Lithophytes, were removed in September, 1780, and during the following Christmas he was busy in preserving the still extant natural objects, which the wood-mice had begun to damage.

The foregoing sentences will show that even during Linné's lifetime much damage had taken place, and the fact that the present condition of such groups as the Lepidoptera is not equal to modern collections of recent acquisition, is attributable rather to faulty methods in pinning and setting, than want of care since Linné's time.

The Amphibia specified were not amongst the collections bought by Smith; they then were the property of the University of Uppsala, and formed part of the University Museum. An enumeration of these will be found in the Bibliography, under the names of Lönnberg and Andersson.

In the account given in Smith's 'Memoir and Correspondence,' several items are mentioned which are no longer extant. The minerals were sold in 1796 by Smith, previous to his leaving London for Norwich. When the fishes in spirits, the birdskins, and the birds' heads disappeared, cannot even be guessed; it is quite certain that they did not come into the keeping of the Linnean Society, but vanished during Smith's possession. The cases in which the insects are now preserved, seem to have been made for Smith; recent investigation goes to show that practically all or nearly all the Linnean types are extant, so far as they were possessed by him, but they are accompanied by many interpolations by Smith, who further entered his additions by marking an underscore in pencil below the numbers in the same copy of the 'Systema Naturæ,' ed. XII. which Linné had previously used. Smith re-ticketed everything, but preserved the Linnean tickets with his new tickets.

The Shells have suffered from attempts to arrange them "according to a modern method" (Proc. 1887-88, p. 31), and a later attempt by Mr. Sylvanus Hauley to put them in order according to his volume, 'Ipsa Linnæi Conchyliæ,' was left unfinished. The original tin boxes are still preserved, but require expert help in assigning them to their rightful species.

Of the Fishes a full account will be found given in the 'Proceedings,' 1898-99, pp. 15-38, in a Presidential Address. They are now in glass-topped boxes arranged in accordance with Dr. Günther's list.

CONTRIBUTORS TO THE COLLECTIONS.

The information which has come down to us concerning the acquisition of the Linnean collections is very meagre, even more so than with the botanical portion, which itself is disappointingly poor. We find, however, a few indications of the early attention to insects and shells, in Linnæus's letters to his early friend and benefactor, Dr. Kilian Stobœus at Lund. By the autumn of 1730 he had more than 400 specimens of insects, all collected with his own hand, therefore chiefly from the province of Upland, in which Uppsala is situated. The next year (1731) he succeeded in getting a considerable number of different kinds of shells for his collection.

These names of the Contributors to the Collections have been gathered chiefly from the tenth and twelfth editions of the '*Systema Naturæ*,' and from a few statements which appeared elsewhere. It is difficult to be certain whether the whole of those named sent specimens, for the method of citation leaves it uncertain in many cases as to whether actual specimens were sent to Linné, or only information. When there has been strong doubt, I have been obliged to strike out names, such as many from the '*Fauna suecica*,' ed. II., 1761.

As to Linné's own collecting, we know from his statements, that whilst a student at Uppsala he collected insects, and had a collection of them set on pins; that next to plants, his delight was in insects, and that during his Uppsala herborisations, the students collected insects, shot birds, etc.

ALLIONI, CARLO (1725-1804). Specimens from Northern Italy.

ALSTRÖMER, *Baron* CLAS (1736-1794). European and Mediterranean region.

ALSTRÖMER, *Baron* JOHAN (1742-1788), brother of the foregoing; contributed a few insects.

ÅMAN, NILS (1730-1783), formerly of Stockholm, finally of Hernösand.

ANGERSTEIN, —, of Hedemora (fl. 1771), mentioned in *Mant.* ii. p. 543.

ARGILLANDER, ABRAHAM (1722-1800). Cf. *Syst.* ed. XII. p. 1077.

ASCANIUS, PEDER (1723-1803), a pupil of Linné, devoted to zoology and mineralogy.

BASTER, JOB (1711-1755). Specimens from the Dutch possessions.

BECKMANN, JOHANN (1739-1811), distinguished pupil, afterwards professor at Göttingen.

BERGER, ALEXANDER MALACHIAS (1737-1804), a former student at Uppsala.

BERGMAN, TORBERN OLOF (1735-1784), a celebrated chemist, formerly a pupil of Linné.

- BERGIUS, PETER JONAS (1730-1790), an eminent Stockholm physician.
- BIERCHÉN, PEHR (1731-1774), naval Surgeon in the Swedish fleet.
- BLOM, CARL MAGNUS (1737-1815), provincial doctor in Hedemora district.
- BRANDER, afterwards SKJÖLDEBRAND, ERIK (1720-1814). Swedish Consul at Algiers, from 1753 to 1765; many insects sent from North Africa.
- BRÜNNICH, MORTEN THRANE (1737-1763), professor of zoology in Copenhagen.
- CELSIUS, OLOF, the elder (1670-1756), mentioned in connection with *Aranea reticulata*.
- CHRISTIERNIN, CARL. "*Phalaena Christiernana*. Upsala lecta ante diem 1763, jun. 26 fatalem observatori Car. Christiernin, eximiae spei juveni." Syst. ed. XII. p. 877.
- CLERCK, CARL ALEXANDER (1709-1765), celebrated draughtsman of insects.
- CYRILLO, DOMENICO (1730-1799), professor in Naples.
- DAHLBERG, Col. CARL GUSTAF (fl. 1754-55). Surinam specimens.
- DE GEER, Count CARL (1720-1778), eminent entomologist; some fishes and serpents were described from his collection by Linné.
- EKEBERG, CARL GUSTAF (1716-1784). Specimens from the East Indies.
- ELLIS, JOHN (1711-1776), a London merchant, and close correspondent of Linné.
- FABRICIUS, JOHAN CHRISTIAN (1745-1808), pupil and eminent entomologist.
- FAGRAEUS, JONAS THEODOR (1729-1797), custodian of Baron C. Alströmer's collection at Alingsås.
- FALK, JOHAN PEHR (1733-1774). Specimens from Russia.
- FERBER, JOHAN HINRIK (1703-1781). Specimens from south of Europe.
- FORSKÅL, PEHR (1736-1768). Specimens from Egypt and Arabia, where he died.
- FÖRSSKÅHL, JOHAN (1691-1762), clergyman in Stockholm; father of preceding, in spite of different spelling.
- FOTHERGILL, JOHN (1712-1780), eminent English medical practitioner; sent insects to Linné.
- FRISCH, JOHANN LEONHARD (1666-1743), gymnasialdirektor in Berlin and writer on birds and insects.
- GABRIEL, *Frater* [*Baron de LATOURDAIGNES*?] (fl. 1757-1768), a Capuchin friar, sent a few specimens from France.
- GAHN, HENRIK (1747-1816). Specimens during his travels in England.
- GARDEN, ALEXANDER (1730-1791). Fishes, etc. from Carolina, through Ellis.
- GEOFFROY, ÉTIENNE LOUIS (1725-1810), eminent French zoologist.

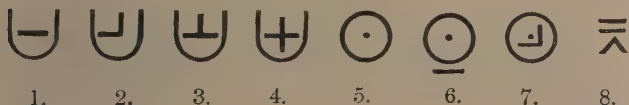
- GOUAN, ANTOINE (1733-1821). Many specimens from Montpellier.
- GRÖNBERG, ANDERS NILS (fl. 1760). Cf. Am. Acad. vi. p. 415.
- GRONOVIVS, JAN FREDRIK (1690-1762), a constant correspondent living at Leyden.
- GUNNER, JOHAN ERNST (1718-1773). Bishop of Trondhjem; marine specimens.
- GYLLENBORG, Count CARL (1679-1746). Chancellor of the University; sent collection of amphibia.
- HAARTMAN, JOHAN JOHANSSON (1725-1787); student at Åbo and Uppsala, in his later years professor of medicine at the former.
- HALLMAN, DANIEL ZACHARIÆ (1722-1782). Spanish specimens.
- HASSELQUIST, FREDRIK (1722-1752), pupil; travelled in the East, Palestine, and died at Smyrna. The queen of Sweden purchased his collections, and Linnæus described them.
- HAST, REINHOLD (1726-1747?), educated for the medical profession, but died early in his career.
- HEISE, JOHANNES GOTTFLOB (fl. 1757). Communicated *Phalangium tricarinatum* from Dresden.
- HOLM, JÖRGEN TYGE (1726-1759), a Danish pupil; after his return home named professor in Copenhagen but died that year.
- HÜPSCH, JOHANN WILHELM CARL ADOLPH, *Freyherr* von (fl. 1768-1781); once mentioned, Mant. p. 547.
- ISACSON, BERGH. Communicated two species of *Asilus* from Germany.
- JACQUIN, Baron NICOLAUS JOSEPH VON (1727-1817), a valued correspondent, living near Vienna.
- KÄHLER, MARTIN (1728-1773), pupil; travelled in South Europe.
- KALLENBERG, —. Mentioned twice in 'Fauna suecica,' ed. II., pp. 149, 232.
- KALM, PEHR (1715-1779), in North America and Canada in 1747-49.
- KLASE, LARS MAGNUS (1722-1766). At one time provincial surgeon at Jönköping, but died in misery at Stockholm due to his reckless life.
- KÖRKERITZ, C. G. Entomologist living at Uppsala; contributed insects.
- KÖNIG, JOHAN GERHARD (1728-1785). Surgeon to the Danish missionaries in India; Indian specimens.
- KUHN, ADAM (1791-1817), pupil from N. America; afterwards professor of medicine in Philadelphia.
- LAGERSTRÖM, MAGNUS (d. 1759). Asiatic rarities were contributed by him.
- LAXMANN, ERIC (1737-1796). Siberian objects.
- L'AMMIRAL, JEAN (b. 1680). Eminent Dutch engraver; amongst other works published 'Collection des insectes.'
- LECHE, JOHAN (1704-1764), professor of anatomy at Åbo; sent insects from Skåne, when living at Lund.

- LÖFLING, PEHR (1729-1756), favourite pupil; Spanish and South American insects.
- LOGIE, FR. (1739-1768), pupil under Linné 1756-58, son of Swedish consul at Algiers; specimens from Gibraltar and N. Africa.
- MALMBORG, —. Mentioned twice in 'Fauna suecica,' ed. II., pp. 197, 216.
- MARTERWILLE, LODEWIJK VAN (fl. 1755). Netherlands Minister at Stockholm; communicated *Phalaena sylvina*. ('Fauna suecica,' ed. II., p. 306.)
- MARTIN, ANTON ROLANDSSON (1729-1786). Spitsbergen objects.
- MAX VON WÜRTEMBERG, *i. e.* MAXIMILIAN III. JOSEF (1727-1777), Kurfürst von Baiern.
- MODEER, ADOLPH (1739-1799), surveyor; good entomologist.
- MORAEUS, JOHANNES (1672-1742). Linné's father-in-law, a practising physician at Fahlun.
- NOORDGREEN, HANS JOHAN (fl. 1759-64). Corresponded with regard to advising despatch of amphibia and insects from Java.
- OSBECK, PEHR (1723-1805). Chiefly Chinese specimens but a few from the neighbourhood of Uppsala.
- PENNANT, THOMAS (1726-1798). English traveller and naturalist.
- RATHGEB, JOSEPH VON (fl. 1744), of Venice.
- RENSTRÖM, CARL FREDRIK (fl. 1752). Author of two papers on insects.
- ROLANDER, DANIEL (1725-1793), a pupil, who collected in Surinam, but gave everything to Count de Geer, through whom Linné received some specimens.
- ROSÉN (afterwards ROSENSTEIN) NILS (1706-1773). Eminent physician, and Linné's colleague in the faculty of medicine at Uppsala.
- SCHAEFFER, JACOB CHRISTIAN (1718-1790). Insects sent from Strassburg.
- SCHAEFFER, HENRIK THEOPHIL (1710-1759), mineralogist, at Ädelfors.
- SCHLOSSER, JOHANN ALBERT (d. 1769), of Amsterdam, had a good library.
- SCHREBER, JOHANN CHRISTIAN DANIEL (1739-1810), a distinguished pupil of Linné, and editor of the last ed. of *Amoenitates Academicæ*.
- SCOPOLI, JOHANN ANTON (1723-1788). Contributed insects from Carniola.
- SHANE, —. Referred to in Syst. Nat. ed. XII. p. 1034.
- SKENE, DAVID (1735?-1771), physician at Aberdeen; contributed zoophytes.
- STRUSSENFELDT, ALEXANDER MICHAËL VON (1716-1797), General; wrote on fishes.

- SOLANDER, DANIEL (1736-1782); favourite pupil, afterwards librarian to Sir Joseph Banks, Bt.
- SPARRMAN, ANDERS (1748-1820). Traveller to China, the Cape, and the Antarctic.
- SPENGLER, LORENZ (1720-1808); conchologist at Copenhagen.
- STARCK, DAVID (fl. 1746-65), professor at Abo.
- STELLER, GEORG WILHELM (1709-1746). Specimens from Kamtschatka.
- STRÖMER, MARTIN (1707-1770), professor of Astronomy at Uppsala.
- THEEL, DANIEL (1744-1795), army surgeon settled at Stockholm; renowned for his skill in operative surgery.
- THUNBERG, CARL PETER (1743-1828); pupil and successor to the younger Linné at Uppsala, travelled much.
- TIDSTRÖM, ANDERS PHILIP (1723-1779); a favourite pupil from his constant liveliness; chiefly a mineralogist.
- TULBAGH, C. RIJK (d. 1771), Governor for 20 years of the Dutch colony at the Cape.
- UDDMAN, ISAAC (1731-1781), a medical man in private practice at Uppsala.
- VANDELLI, DOMINGOS (fl. 1768-89), professor at Lisbon; Portuguese and Brazilian specimens.
- WAHLBOM, JOHAN GUSTAF (1724-1807), a favourite pupil; afterwards in medical practice at Kalmar.
- WILKE, SAMUEL GUSTAV (fl. 1760-65; d. 1791); entomologist of Greifswald.
- WÜRTEMBERG, MAX VON, *cf.* MAXIMILIAN III.
- ZOEGA, JOHAN (1742-1797); pupil from Denmark, much esteemed by Linné.

PECULIAR MARGINAL SIGNS.

In the interleaved and annotated copy of ed. X. of the *Systema* which was marked by Linné, and is the earlier catalogue of his zoological collections, we meet with special signs in the margin peculiar to this volume, they are these:—



I have enquired of entomologists at home and in Sweden in vain for any explanation of these signs. As, therefore, no one else has ventured to make any suggestion, I venture to do so myself, and in the absence of any definite information, to put forward a theory in place of none. From the small size of the signs, it is sometimes difficult to be sure of the shape intended, hence the doubts indicated below.

Linné was called upon to describe the collections of King Adolf Fredrik at Ulriksdal, and of Queen Ludovica Ulrica at Drottningholm. We know that the queen allowed him to have a specimen of Hasselquist's plants whenever there were three, and I suggest that these signs refer, Nos. 1 to 4, to Queen Ulrica's collection, and Nos. 5 to 7 to the King's Museum. I interpret the signs as showing the number of the given insect in the collection seen by Linné, thus:—

1. One specimen in the Queen's collection.
2. Two specimens , " "
3. Three " " " " " The sign doubled
may stand for six.
4. Four " " " "
5. One specimen in the King's collection.
6. Two specimens " "
7. Three " " "
8. Unknown; it occurs only once.

It may serve as a test of these views, if I append lists of the various species marked with these signs; if I am right in my interpretation, it may serve as an additional piece of historical information relative to the Royal collections.

Queen Ulrica's Collection.

- One specimen : *Papilio Anchises*?, *Stelenes*, *Sophorae*?, *Nauplius*.
 Two specimens : *Papilio Hector*, *Paris*, *Memnon*, *Helena*?, *Eurypylus*, *Calliope*, *Midamus*, *Panopea*, *Marsyas*, *Caricae*, *Pherectus*.
 Three specimens : *Papilio Priamus*, *Glaucus*, *Panthous*, *Menelaus*, *Ulysses*, *Agamemnon*, *Diomedes*, *Pyrrhus*, *Zeilus*, *Ajax*, *Protesilaus*, *Achilles*, *Teucer*, *Idomeneus*, *Demoleus*, *Nireus*, *Philoctetes*, *Pierae*, *Polymnia*?, *Thalia*?, *Erato*?, *Anacardii*, *Eurippe*, *Glaucippe*, *Pyranthe*, *Arsalte*, *Hyparete*, *Niavius*, *Cassine*, *Feronia*, *Helia*, *Lampetia*, *Amatheia*, *Venilia*, *Bolina*, *Acesta*, *Cytherea*, *Vanillae*, *Philocles*, *Athemon*, *Lysippus*, *Proteus*, *Phidias*, *Tiphys*, *Jason*, *Iphiclus* " ? ", *Hylas*, *Eurytus*, *Zetes*, *Neleus*, *Pinthous* " ? ".
Sphinx Caricae, *Labruscae*, *Megaera*.
Phalaena Cecropia, *Luna*, *virgo*, *fenestra*, *perspicua*, *odorata*, *militaris*, *Strix*, *Lunus*, *crepuscularis*, *occidua*, *punctigera*, *Domitilla*, *Fulvia*, *ornatrix*, *rubricollis*, *Fraxini*, *lucipora*, *Sambucaria*, *tripunctaria*, *tricinctaria*, *Jatropharia*, *flaveolata*, *Janata*.
 Four specimens : *Papilio Patroclus*, *Demophon*, *Xanthus*?, *Aeropa*, *Pipileis*, *Dirce*? *Bixae*?, *Polycletus*?.
Sphinx Ficus.
Phalaena Hesperus, *Paphia*, *Pellex*, *Heliconia*, *aestuata*, *bella*.
 Six specimens : *Papilio Helenus*, *Deiphobus*, *Obrinus*.

King Adolf Fredrik's Collection.

- One specimen : *Papilio Polytes*, *Agenor*, *Demoleus*, *Aglaia* [= *Pasithoë* MS.], *Hecabe*, *Plexippus*, *Chrysippus*, *Almana*, *Lemonias*, *Leda*, *Alcmena*, *Lemothoë*, *similis*, *assimilis*, *dissimilis*.

Sphinx culiciformis, *Phegea*, *Polymena*.

Phalaena Atlas, *monacha*, *Aulica*, *Sannio*, *Celsia*, *Capucina*,
helvola, *complexa*, *chrysithrix*, *conspicillaris*, *strigilis*, *falcata*,
purpurea, *undulata*, *immutata*, *immorata*, *viridans*,
Solandriana, *purpuralis*, *lutarella*, *vestianella*, *Lappella*, *Turionella*, *Clerkella*.

Two specimens: *Papilio Pammon*.

Three specimens: *Papilio Mineus*.

The sign ☉ having been used so frequently by Linné in the sense of Annual, the first explanation which occurred, was, that it might apply to the number of broods in each year, but information kindly supplied by Mr. STANLEY EDWARDS, F.L.S., showed that this view was untenable, and the interpretation as explained previously was adopted. It may be noticed that *Papilio Demoleus* appears in each of the collections; *P. Alemena* was first marked by Linné as being in the Queen's collection, but afterwards corrected to the King's, and that *P. Phereclus* was first marked for three specimens and altered to two, in the Queen's collection. Whether any of the Lepidoptera from the Royal cabinets ever enriched those of Linné, cannot be definitely stated.

There are many instances of dots prefixed to the names of species; what was meant I cannot say. In a few cases dots are employed *under* the names or numbers, and I have regarded these as equivalent to underscoring, and in some cases there is a transition from dots to underscores.

BIBLIOGRAPHY.

- LINNÉ, CARL von (1707–1778), formerly Linnæus.
 1745–55. Fauna suecica. Stockholmiae, 1745.
 ed. II. *ib.* 1755.
 1758–67. Systema Naturae, ed. X. Holmiae, vol. i. 1758.
 8vo.
 — ed. XII. Holmiae, vol. i. 1766–67.
 1763. Centuria insectorum rariorum . . . submittit Boas
 Johansson . . . Upsaliae, 1763. 4to.
 Repr. in Am. Acad. vi. pp. 384–415.
 1771. Mantissa plantarum altera. Holmiae, 1771.
 (Regni animalis appendix, pp. 521–552.)
 1845. HAGEN, HERMANN AUGUST.
 Die neuroptera der Linnéischen Sammlung.
 Stettin, Entom. Zeit. vi. (1845) 155–156.
 1851. HALIDAY, ALEXANDER HENRY.
 Sendschreiben . . . an C. A. Dohrn über die Dipteren
 der in London befindlichen Linnéischen Sammlung . . .
 übersetzt von Anna Dohrn.
 Stettin, Entom. Zeit. xii. (1851) 131–145.

1855. HANLEY, SYLVANUS.

Ipsa Linnæi Conchylia. The Shells of Linnæus, determined from his manuscripts and collection . . . also an exact reprint of the *Vermes testacea* of the 'Systema Naturæ' and 'Mantissa.'

London, 1855. pp. 4, 556, pls. 5.

1855-59. MOTSCHULSKY, VICTOR von.

Sur les collections coléoptérologiques de Linné et de Fabricius.

Helsingfors, *Etudes Entom.* iv. (1855) 25-71; v. (1856) 60-75; vi. (1857) 44-58; vii. (1858) 123-152; viii. (1859) 147-162.

1857. SMITH, FREDERICK.

List of the typical specimens of Vespidae in the Linnæan Collection, preserved in the Museum of the Linnæan Society, referred to the genera in which they appear in this Catalogue.

Cat. Hymen. Ins. Brit. Mus., vol. v. Vespidae, p. 139.

1879. WALLENGREN, H. D. J.

An analysis of the species of Caddis-flies (*Phryganea*) described by Linnæus in his 'Fauna suecica.' Communicated (with notes) by R[obert] M'Lachlan.

Journ. Linn. Soc., Zool. xiv. (1879) 726-736.

1884. AURIVILLIUS, PER OLOF CHRISTOPHER.

Recensio critica Lepidopterorum Musei Ludovicae Ulrica quae descripsit Carolus a Linné.

Stockholm; K. Sv. Vet.-Akad. Handl. xix. No. 5 (1884) pp. 1-188, tab. 1 col.

1885. GOODE (GEORGE BROWN) & TARLETON HOFFMANN BEAN.

On the American Fishes in the Linnæan collection.

Proc. U.S. Nat. Mus. viii. (1885) pp. 193-208.

1888. JACKSON (BENJAMIN DAYDON).

Report on the Linnean Collections.

Proc. Linn. Soc. 1887-88, pp. 25, 31-33.

1896. LÖNNBERG (AXEL JOHAN EINAR).

Linnean type-specimens of Birds, Reptiles, Batrachians, and fishes in the Zoological Museum of the R. University in Upsala.

Bihang K. Sv. Vet.-Akad. Handl. xxii. Afd. iv. No. 1 (1896).

1899. ANDERSSON (LARS GABRIEL).

Catalogue of Linnean type-specimens of Snakes in the Royal Museum in Stockholm.

Bihang K. Sv. Vet.-Akad. Handl. xxiv. Afd. iv. No. 6 (1899).

1899. GÜNTHER (ALBERT CARL LEWIS GOTTHILF).
Presidential Address [with catalogue of the fishes in the
Linnean collection belonging to the Linnean Society].
Proc. Linn. Soc. 1898-99 (1899) pp. 15-38.
1902. CHAPMAN, THOMAS ALGERNON.
The type-specimen of *Phalaena atra*, Linn.=*Acan-*
thopsyche opacella.
Entom. Record, xiv. (1902) 57-58.
1906. HEYLAERTS, F. J. M.
Remarques sur quelques Psychides.
Ann. Soc. Entom. Belg. l. (1906) 97-98.
1907. CHAPMAN, THOMAS ALGERNON.
Remarks on some Psychids (a rejoinder to the
foregoing).
L. c. li. (1907) 57-59.
1909. TUTT, JAMES WILLIAM.
Discussion on the two similar species *Plebeius argus*
(*aegon*) and *P. argyrognomon*.
London, Proc. Entom. Soc. 1909, pp. xii-xiii.
1913. VERITY, ROGER.
Revision of the Linnean Types of Palæarctic
Rhopalocera.
Journ. Linn. Soc., Zool. xxxii. (1913) 173-191.

AMPHIBIA.

From marked copy of Syst. Nat. ed. X. (1758).

TESTUDO. p. 197.

- Mydas (1).
- Caretta (2).
- orbicularis (3).
- scabra (4).
- lutaria (5).
- graeca (6).
- carinata (8).
- geometrica (9).
- pusilla (10).

LACERTA. p. 200.

- Crocodylus (1).
- superciliosa (3).
- Monitor (5).
- principalis (6).
- bicarinata (7).
- palustris (8).
- Cordylus (9).
- Ameiva (14).
- agilis (15).
- Seps (17).
- Chamaeleon (19).
- Salamandra (20).
- Gecko (21).
- aquatica (26).
- Igvana (28).
- Calotes (29).
- Agama (30).
- Umbra (31).
- marmorata (33).
- Teguixin (36).
- aurata (37).
- lemniscata (39).

RANA. p. 210.

- Pipa (1).
- gibbosa (4).

RANA :—

- Bombina MS. ["variegata"]
- olim (5).
- ocellata (9).
- marginata (11).
- paradoxa (12).
- temporaria (13).
- esculenta (14).
- Hyla (15).
- arborea (16).
- boans (17).

CROTALUS. p. 214.

- Dryina.
- Durissus.

BOA. p. 214.

- canina.
- Constrictor.
- Cenchria.
- Hortulana.

COLUBER. p. 216.

- Ammodytes (174).
- plicatilis (?) (177).
- angulatus (182).
- Berus (183).
- Chersea (184).
- caeruleus (189).
- Cobella (204).
- vittatus (220).
- cyaneus (229).
- Aesculapii (223).
- agilis (234).
- pallidus (251).
- lineatus (252).
- sibilans (260).
- atrox (263).
- Sibon (264).
- carinatus (273).

COLUBER:—

Triscalis (282).
 lemniscatus (285).
 annulatus (286).
 Petola (299).
 Ahaetulla (313).
 Hippocrepis (326).
 Cenchoa (344).
 mycterizans (359).
 caerulescens (385).

ANGUIS. p. 227.

Scytale (253).
 fragilis (270).

AMPHISBAENA. p. 229.

fuliginosa (230).

CAECILIA. p. 229.

tentaculata (135).

SQUALUS. p. 233.

Acanthias (1).
 Squatina (4).
 Canicula (8).

INSECTA.

From marked copy of Syst. Nat. ed. XI I., with Notes from ed. X

I. COLEOPTERA.

SCARABAEUS. p. 541 (345).

1. Hercules.
2. Gideon.
3. Actaeon.
4. Simson.
6. Atlas.
7. Aloëus.
8. Molossus (12).
8. Typhaeus.
10. lunaris (8).
11. cylindricus (9).
12. bilobus.
15. nasicornis (7).
17. Mimas (13).
18. sacer (14).
21. hispanus.
22. carnifex.
24. nuchicornis (17).
25. Vacca.
26. Taurus.
27. Bison.
28. subterraneus (18).
29. erraticus (19).
30. maurus.

SCARABAEUS:—

31. Fossor (21).
32. fimetarius (22).
33. haemorrhoidalis (23).
34. conspurcatus (24).
35. marianus.
38. laticollis.
40. pilularius.
41. Schaefferi.
42. stercorarius (30).
43. vernalis (31).
45. Schreberi.
46. ovatus.
48. sabulosus (33).
50. surinamus.
51. nitidus.
54. sticticus.
57. Fullo (46).
58. agricola.
59. Horticola (42).
60. Melolontha (43).
61. solstitialis (44).
63. hemipterus (45).
64. farinosus.
65. aulicus.
66. longipes.

-SCARABAEUS:—

68. squalidus.
70. fasciatus (47).
indus (48).
72. brunnus (49).
73. capensis.
74. Eremita.
75. fascicularis.
76. punctatus.
78. auratus (52).
79. variabilis (53).
81. nobilis (54).
83. quisquilius.
86. rufipes (55).

LUCANUS. p. 559.

1. Cervus (58, Scarabaeus).
4. interruptus (59, Scarab.).
6. parallelepipedus (62,
Scarab.).
7. Caraboides (63, Scarab.).

DERMESTES. p. 561 (354).

1. lardarius (1).
2. elongatus.
3. undatus (2).
4. pellio (3).
pectinicornis (4),
cf. Ptinus.
5. Capucinus (3).
clavicornis (5).
pertinax (6), *cf.* Ptinus.
mollis (7), *cf.* Ptinus.
7. typographus (9).
9. micrographus (10).
10. poligraphus (11).
11. piniperda (12).
12. domesticus (15).
13. violaceus (13).
14. hirtus.
15. fenestralis (14).
16. melanocephalus (16).
17. Scarabaeoides (19).
18. murinus (17).
pilula (18).
19. paniceus.
pisorum (21).
21. ferrugineus.

DERMESTES:—

23. pedicularius (25).
24. pulicarius (26).
28. niger.

PTINUS. p. 565.

1. pecticornis (4, Dermestes).
2. pertinax (6, Dermestes).
3. mollis (7, Dermestes).
4. imperialis.
5. Fur (33, Cerambyx).
6. germanus.

HISTER. p. 566 (358).

2. major.
3. unicolor (1).
4. pygmaeus (2).
5. bimaculatus (3).
6. 4-maculatus (4).

GYRINUS. p. 567.

1. natator.
2. americanus.

BYRRHUS. p. 568.

1. Scrophulariae
(20, Dermestes).
2. Muscorum.
3. Verbasci.
4. Pilula.

SILPHA. p. 569 (359).

1. germanica (1).
2. Vespillo (2).
3. bimaculata.
4. bipustulata (3,
"bipunctata").
5. 4-pustulata (4,
"bipunctata").
7. americana.
8. seminulum (7).
maura (9).
11. littoralis (11).
12. atrata (12).
13. thoracica (13).
14. quadripunctata.
15. opaca (14).
16. rugosa (15).
17. sabulosa (16).

SILPHA :—

18. obscura (17).
19. ferruginea (18).
20. reticulata.
21. grossa (19).
22. oblonga (20).
23. scabra.
24. rufipes.
25. aquatica (21).
27. colon (22).
29. depressa (23).
30. grisea (24).
31. testacea.
32. aestiva (25).
34. pedicularia (26, -is).

CASSIDA. p. 574 (362).

1. viridis (1).
2. murraea.
3. nebulosa (2).
4. nobilis (3).
5. vibex.
6. maculata.
7. spinifex.
8. bicornis.
11. flava.
15. reticularis.
16. variegata.
21. jamaicensis.
22. cyanea.
23. marginata.
24. inaequalis.
26. lateralis.
27. discoides.
30. bipustula.

COCCINELLA. p. 579 (364).

4. impunctata [sic].
5. annulata.
6. unipunctata (1).
7. 2-punctata (2).
8. 3-punctata (3).
9. 4-punctata.
10. hebraea (4).
11. 5-punctata (5).
13. trifasciata (6).
14. hieroglyphica (7).

COCCINELLA :—

15. 7-punctata (8).
16. 9-punctata (9).
18. 11-punctata (11).
20. 13-punctata (12).
21. 14-punctata (13).
22. 16-punctata.
23. ocellata (14).
24. 18-punctata.
25. 19-punctata (15).
26. 22-punctata (16).
- 24-punctata (17).
29. 25-punctata.
31. conglomerata.
34. 14-guttata (22).
35. 16-guttata (23).
36. 18-guttata (24).
37. 20-guttata (25).
38. oblongo-guttata (26).
39. oblitterata (27).
40. impustulata.
42. 2-pustulata (28).
43. 4-pustulata (29).
44. 6-pustulata (30).
45. 10-pustulata (31).
46. 14-pustulata (32).
49. tigrina (36).

CHREYSOMELA. p. 586 (368).

3. 5-punctata.
4. göttingensis (1).
5. Tanaceti (2).
6. haemorrhoidalis (3).
7. Graminis (4).
8. aenea (5).
9. Alni (6).
- Betulae (7).
11. haemoptera (8).
- occidentalis (9).
16. Armoraciae (11).
17. cerealis.
18. fastuosa.
19. speciosa.
20. halensis.
- Hypochaeridis (12).
22. vulgatissima (13).
23. vitellinae (14).

-CHRYSOMELA :—

24. *Polygoni* (15).
25. *pallida* (16).
26. *staphylaea* (17).
27. *polita*.
28. *lurida*.
30. *Populi* (20).
31. *Viminalis* (21).
32. *10-punctata* (22).
33. *variolosa*.
34. *lapponica* (23).
35. *undulata*.
36. *Boleti* (24).
37. *collaris* (25).
38. *sanguinolenta* (26).
39. *marginata* (27).
40. *marginella* (28).
- aestuans* (29).
43. *coccinea* (30).
50. *minuta* (34).
51. *oleracea* (35).
53. *chrysocephala* (36).
54. *Hyoseyami* (37).
55. *atricilla*.
56. *erythrocephala* (38).
58. *Helxines* (39).
59. *exsoleta* [sic] (40).
60. *nitidula* (41).
62. *nemorum* (42).
65. *rufipes*.
67. *holsatica* (44).
68. *hemisphaerica* (45).
73. *tridentata* (49).
74. *Gorteriae*.
75. *aurita*.
76. *4-punctata* (50).
- 2-punctata* (51).
77. *4-maculata*; cf. n. 103.
79. *8-guttata*.
80. *4-pustulata*.
82. *Moraei* (52).
84. *nitens* [nitida, (53)].
85. *Barbareae*.
86. *sericea* (54).
87. *labiata*.
88. *Coryli* (55).
89. *Pini* (56).
90. *bothnica* (57).

CHRYSOMELA :—

91. *cordigera* (58).
92. *6-punctata* (59).
93. *10-maculata* (60).
95. *longimana*.
96. *obscura* (61).
97. *merdigera* (62).
99. *Nymphaeae* (63).
100. *Capraea* (64).
101. *calmariensis*.
102. *tenella*.
103. *4-maculata* (65).
104. *cyanella* (66).
105. *melanopa* (68, -pus).
106. *flavipes*.
107. *tomentosa*.
110. *12-punctata* (67).
111. *Phelandrii* (69).
112. *Asparagi* (70).
114. *sulphurea* (72).
115. *cervina* (73).
116. *caraboides*.
117. *ceramboides* (74).
118. *murina* (75).
119. *hirta* (76).
120. *pubescens*.
122. *elongata* (78).

HISPA. p. 603.

1. *atra*.
2. *testacea*.
5. *clavicornis* MS.

BRUCHUS. p. 604.

1. *Pisi*.
2. *Theobromae*.
3. *Gleditsiae*.
4. *Bactris*.
5. *granarius*.
6. *seminarius*.
7. *pecticornis*.

CURCULIO.

p. "506" = 606 (377).

1. *Palmarum*.
- indus*.

CURCULIO :—

- hemipterus.
- 4. Alliariae.
violaceus (4).
- 9. aequatus.
- 13. acridulus.
- 16. granarius (12).
- 17. dorsalis (13).
- 19. Pini (15).
- 20. Lapathi (17).
- 21. cupreus (18).
- 22. scaber.
- 23. T. album (20).
- 24. ruficollis.
arator [=Polygoni, MS.]
(22).
- 27. Viscariae.
- 30. 5-maculatus (25).
- 32. Sprengleri.
- 34. paraplecticus (29).
- 35. anguinus.
- 37. algius (30).
- 38. Bacchus (31).
- 39. Betulae (32).
- 40. Populi (33).
- 43. Salicis (35).
- 44. Fagi (36).
- 46. Pomorum (38).
- 47. ovalis.
- 48. carbonarius (40).
- 57. Abietis (49).
- 58. germanus (50).
- 59. Nucum (51).
- 60. Rumicis (16).
- 61. Scrophulariae (27).
- 65. hispidus (53).
rectirostris [Druparum,
MS.] (54).
- 66. pedicularius (55).
- 67. tortrix.
- 68. Ligustici (56).
- 70. cervinus.
- 71. oblongus.
- 72. Pyri (57).
oblongus (58).
- 73. argentatus (59).
ovatus (60).
cervinus (61).

CURCULIO :—

- 76. viridis (63).
- 78. ruficornis (65).
- 79. albinus (66).
- 80. lineatus (67).
- 84. nebulosus (71).
- 85. sulcirostris.
- 88. barbarus (74).
cornutus (75).
- 89. capensis.
- 90. verrucosus.

ATTELABUS. p. 619 (387).

- 1. Coryli (1).
- 2. Avellanae.
- 3. curculionoides.
- 5. pensylvanicus (3).
- 7. Betulae (4).
- 8. formicarius.
- 10. apiarius (7).
- 11. mollis (8).
- 12. Ceramboides (9).
- 13. Buprestoides (10).

CERAMBYX. p. 621 (388).

- 1. longimanus.
- 3. cervicornis.
- 5. imbricornis.
- 7. coriarius (4).
- 8. melanopus.
- 9. thomae.
- [11. festivus ?]
- 12. depsarius.
- 14. lineatus.
- 18. barbicornis.
- 22. araneiformis.
- 26. depressus.
- 27. 4-maculatus.
- 34. moschatus (22).
- 35. alpinus (23).
- 36. capensis.
- 37. aedilis (24).
- 38. sutor (25).
- 39. cerdo (26).
- 41. textor (27).
- 42. tristis.
- 43. fuliginator (28).

CERAMBYX:—

45. cursor (30).
46. lamed (16).
nebulosus (17).
hispidus (18).
47. meridiana.
48. noctis
49. inquisitor (32).
fur (33).
50. Kaehleri.
51. pedestris.
52. carcharias (34)
55. scalaris (35).
56. Cardui.
57. populneus.
58. linearis.
59. cylindricus.
60. oculatus (38).
64. curculionoides.
65. serraticornis (40).
66. hispicornis.
67. rusticus (41).
69. femoratus (42).
70. violaceus (43).
auratus (44).
stigma (45).
73. striatus.
74. variabilis.
75. testaceus.
76. bajulus (48).
78. liciatus.
79. undatus (50).
80. sanguineus (51).
81. castaneus (52).
82. cantharinus
83. ebulinus.

LEPTURA. p. 637 (397).

1. aquatica (1).
2. melanura (2).
3. rubra (3).
4. sanguinolenta.
5. testacea.
6. revestita.
7. virens (4).
8. sericea (5).
9. 4-maculata (6).
meridiana (7).

LEPTURA:—

10. interrogationis (8).
11. 6-maculata (9).
12. 4-fasciata (10).
13. attenuata (11).
14. nigra (12).
15. virginea (13).
16. collaris (14).
17. rustica (15).
18. mystica (16).
19. Alni.
20. detrita (18).
21. arcuata.
22. Verbasci.
23. arietis (20).
24. praeusta.

NECYDALIS. p. 641 (421).

1. major.
2. minor.
3. umbellatarum.
4. caerulea.
5. atra.
6. rufa.
8. flavescens.
9. Podagrariae.
10. simplex.

LAMPYRIS. p. 643.

1. Noctiluca (Cantharis, 1).
2. corrusca.
3. splendidula.
10. mauritanica (Canth., 7).
11. italica (Canth., 9).
14. latissima.
15. rostrata.
16. bicolor.
17. sanguinea (Canth., 13).

CANTHARIS. p. 647 (400).

2. fusca (10).
3. livida (11).
4. rufa.
5. obscura (14).
7. aenea (16).
8. bipustulata (17).
9. pedicularia (18).

CANTHARIS :—

10. fasciata (19).
11. biguttata (20).
12. minima (21).
13. Cardiacae.
14. albicans.
15. testacea (22).
16. atra.
22. caerulea (27).
23. viridissima (28).
26. navalis (29).
27. melanura (30).

ELATER. p. 651 (404).

1. flabellicornis.
3. oculatus.
4. noctilucus.
6. porcatus.
7. ligneus.
10. brunneus (4).
12. cruciatus.
13. linearis (7).
14. ruficollis (8).
15. lineatus.
16. mesomelus.
17. aterrimus.
18. castaneus (10).
19. livens.
20. ferrugineus (11).
21. sanguineus (12).
22. balteatus (13).
23. marginatus.
24. sputator (15).
25. obscurus (16).
26. tristis (17).
27. fasciatus (18).
28. murinus (19).
29. tessellatus (20).
31. aeneus (21).
32. pectinicornis (22).
33. niger (23).
34. minutus (24).
37. buprestoides.

CICINDELA. p. 657 (407).

1. campestris (1).
2. hybrida (2).

CICINDELA :—

3. capensis.
4. germanica (3).
6. carolina.
8. sylvatica (4).
9. maura.
10. riparia (6).
11. flavipes.
14. aquatica (7).

BUPRESTIS. p. 659 (408).

1. gigantea (1).
2. 8-guttata (2).
3. ignita (3).
5. sternicornis (5).
6. mariana (6).
7. chrysostigma (7).
8. rustica (8).
9. austriaca.
10. aurulentus.
11. Tenebrionis.
12. fascicularis.
13. hirta.
14. Rubi.
15. nitidula (11).
17. 9-maculata.
22. 4-punctata (16).
23. minuta (17).
25. viridis (18).
26. atra.
27. festiva.

DYTISCUS. p. 664 (411).

1. piceus (1).
3. Scarabaeoides (15).
4. fuscipes (3).
5. luridus.
6. latissimus (4).
7. marginalis (5).
8. semistriatus.
9. striatus (6).
10. fuscus (7).
11. cinereus (8).
13. sulcatus (10).
14. erythrocephalus (11).
15. maculatus.
16. ferrugineus.

- DYTISCUS:—

17. bipustulatus.
20. uliginosus.
23. minutus (13).
- natator (14).

CARABUS. p. 668 [recte] (413).

1. coriaceus (1).
2. granulatus (2).
3. hortensis (5).
4. leucophthalmus (3).
5. clatratus.
6. nitens (4).
7. auratus.
8. violaceus (6).
9. cephalotes (7).
10. 10-guttatus.
11. inquisitor (8).
12. sycophanta (9).
14. fastigiatus.
15. lividus (10).
16. marginatus.
17. complanatus.
18. crepitans (11).
21. cyanocephalus (14).
22. melanocephalus (15).
23. vaporariorum (16).
24. latus (17).
25. ferrugineus (18).
26. germanus (19).
27. vulgaris (20).
28. caerulescens (21).
29. cupreus (22).
30. piceus (23).
32. multipunctatus (25).
33. 2-punctatus.
34. 4-pustulatus.
35. 6-punctatus (26).
36. meridianus.
38. ustulatus (27).
39. crux major (28).
40. crux minor (29).
41. 4-maculatus (30).
- atricapillus (31).

TENEBRIO. p. 674 (417).

1. Gigas.

TENEBRIO:—

2. molitor (1).
- mauritanicus (2).
3. chalybeus.
5. culinaris (3).
6. barbarus (4).
7. Fossor (5).
8. Cursor.
- pedicularis (7).
- erraticus (8).
10. pallens (9).
11. depressus.
13. quisquilius.
14. "gigas," *sphalm. loco*
gages.
15. mortisagus (10).
16. grossus.
20. rostratus.
24. spinosus.
26. Silphoides.
27. rugosus.
28. variabilis.
29. laevigatus.
30. latipes.
32. femoralis.
33. striatulus.

MELO. p. 679 (419).

1. Proscarabaeus (1).
2. majalis (2).
3. vesicatorius (3).
- syriacus (4).
5. Cichorii (5).
6. 4-punctata.
7. capensis.
9. bimaculatus.
11. algiricus (6).
12. Schaefferi.
13. Marci.
14. Monoceros.
15. floralis (8).
16. antherinus.

MORDELLA. p. 682 (420).

1. paradoxa.
2. aculeata (1).
3. humeralis (2).
4. frontalis (3).

MORDELLA :—

- 5. thoracica.
- 6. flava (5).

NECYDALIS (421).

- major (1).
- minor (2).

STAPHYLINUS. p. 683 (421).

- 1. hirtus (1).
- 2. murinus (2).
- 3. maxillosus (3).
- 4. erythropterus (4).
- 5. politus (5).
- 6. rufus (6).
- 7. lunulatus.
- 8. riparius.
- 9. obtusus.
- 10. lignorum.
- 11. Silphoides.
- 14. elongatus.
- 15. 2-guttatus.
- 18. littoreus.
- 19. sanguineus.
- 20. Caraboides.
- 23. fuscipes.
- 24. rufipes.
- 25. piceus.
- 26. Boleti.

FORFICULA. p. 686 (423).

- 1. auricularia (1).
- 2. minor (2).

HEMIPTERA.

BLATTA. p. 687 (424).

- 1. gigantea.
- 4. americana.
- 7. orientalis (7).
- 8. lapponica (8).
- 9. germanica.

MANTIS. p. 689 *cf. seq.*

GRYLLUS. p. 692 (425).

GRYLLUS :—

- (Mantis).
- religiosus (5).
- precarius (7).
- (Bulla).
- bipunctatus (17).
- subulatus (18).
- (Acheta).
- Gryllotalpa (19).
- domesticus (20).
- campestris (21).
- (Tettigonia).
- myrtifolius (25).
- viridissimus (38).
- verrucivorus (38[bis]).
- (Locusta).
- Elephas (40).
- migratorius (45).
- stridulus (50).
- viridulus (55).
- biguttulus (56).
- rufus (57).
- grossus (58).
- pedestris (59).

FULGORA. p. 703.

- 1. Laternaria (Cicada, 1).
- 3. Candelaria.
- 8. truncata.
- 9. europaea.

CICADA. p. 704 (434).

- 6. cornuta (10).
- 7. aurita (11).
- 10. bifasciata (14).
- 14. haematodes.
- 15. plebeja.
- 16. Orni.
- 22. sanguinolenta.
- 23. coleoptrata (23).
- 24. spumaria (24).
- 25. nervosa (25).
- 26. leucophthalma (26).

CICADA :—

- 27. albifrons (27).
- 29. lateralis (29).
striata (30).
- 31. lineata (31).
- 32. Populi.
- 33. flavicollis.
- 35. interrupta (32).
- 37. Lanio.
- 43. leporina.
- 44. cunicularia.
- 46. viridis (38).
- 51. Coryli.

NOTONECTA. p. 712 (439).

- 1. glauca (1).
- 2. striata (2).
- 3. minutissima (3).

NEPA. p. 713 (440).

- 1. grandis (1).
- 4. atra.
- 5. cinerea (5).
- 6. Cimicoides (6).
- 7. linearis.

CIMEX. p. 715 (441).

- 1. lectularius (1).
- 3. nobilis.
- 4. Scarabaeoides.
- 5. maurus (4).
- 6. lineatus (5).
- 7. grammicus.
- 8. fuliginosus.
littoralis (10).
- 13. grylloides.
- 15. rugosus (11).
- 16. clavicornis (12).
- 17. corticalis (13).
- 18. Betulae (14).
- 22. rhombeus.
- 23. bidens (18).
- 24. rufipes (19).
- 25. ictericus.
- 27. haemorrhous.
- 28. marginatus (20).
- 30. scaber.

CIMEX :—

- 31. puniceus.
- 34. punctatus (23).
- 35. hæmorrhoidalis (24).
- 36. valgus.
- 43. griseus (32).
- 44. interstinctus (33).
- 45. baccarum (34).
variolosus (36).
- 48. Juniperinus.
- 49. prasinus.
- 50. caeruleus (38).
lineola (39).
- 51. Morio.
- 53. oleraceus.
- 55. bicolor (42).
ornatus (43).
- 57. festivus.
- 59. acuminatus (45).
- 60. leucocephalus (46).
- 62. cristatus.
- 64. personatus (48).
- 65. longipes.
- 67. intrafasciatus.
- 68. semiflavus.
- 71. annulatus (49).
- 72. ater (50).
- 73. gothicus (51).
- 75. lanarius.
- 76. Hyoseyami (53).
- 77. equestris (54).
- 78. apterus (55).
- 81. saxatilis.
- 85. superciliosus.
- 86. pratensis (59).
- 87. campestris (60).
- 88. melanocephalus.
- 90. umbratilis (61).
- 92. crassicornis (62).
- 93. saltatorius (63).
- 95. arenarius (64).
- 96. Pini (65).
- 98. Rolandri (66).
- 99. ferrugineus.
- 101. laevigatus (68).
- 103. dolabratus (69).
- 105. striatus (70).
ferus (72).

CIMEX :—

- 109. Populi.
- 110. Ulmi (74).
- 113. phyllopus.
- 114. calcaratus (78).
- 115. Abietis (79).
- 117. lacustris (81).
- 118. stagnorum (82).
- 119. vagabundus (83).
- 120. Tipularius (84).

CHERMES. p. 737 (453).

- 6. Calthae.
- 8. Urticae.

COCCUS. p. 739 (455).

- 2. Aonidum.
- 3. capensis.
- 6. Ilicis.
- 19. Uvae ursi.

LEPIDOPTERA.

PAPILIO. p. 744 (458).

— (Equites).

- 3. Paris (3).
- 4. Helenus (4).
- 5. Polytes (7).
- 8. Pammon (8).
- 13. Memnon (12).
- 14. Agenor (13).
- 15. Sarpedon (14).
- Agamemnon (21).
- Diomedes (22).
- 25. Pyrrhus.
- 26. Jason [= Jasius, MS.].
- 31. Leilus.
- 32. Ajax.
- 33. Machaon (27).
- 36. Podalirius.
- 46. Demoleus (35).

— (Heliconii).

- 50. Apollo (41).
- 51. Mnemosyne (42).

PAPILIO (Heliconii) :—

- 54. Horta.
- 59. Mneme.
- 63. Ricini.
- A. Antiochus, MS.
- 65. Charithonia.
- 70. Erato.
- 71. Melpomene.
- (Danai).
- 72. Crataegi (57).
- 75. Brassicae (58).
- 76. Rapae (59).
- 77. Napi (60).
- 78. Hellica.
- 79. Sinapis (61).
- 81. Daplidice (62).
- 84. Belia.
- 85. Cardamines (63).
- 86. Pyrene.
- 87. Euippe.
- 95. Scylla.
- 96. Hecabe (74).
- Midamus (75).
- 98. Pyranthe (66).
- 99. Palaeno.
- 100. Hyale (71).
- 101. Electra.
- 105. Cleopatra.
- 106. Rhamni (73).
- Plexippus (80).
- Chrysippus (81).
- 123. Philomelus.
- 124. Clytus.
- 125. Cassus.
- Mineus (84).
- 127. Hyperantus (85).
- Pamphilus (86).
- 130. Hyperbius.
- (Nymphales).
- Io (188).
- 132. Almana (89).
- Oenone (92).
- 136. Lemonias.
- Orithya (94).
- 139. Briseis.
- Maera (96).
- 144. Ligea (97).

PAPILIO (Nymphales) :—

- Aegeria (98).
 145. Laomedea.
 147. Galathea (99).
 Semele (101).
 149. Hermione.
 150. Phaedra.
 151. Leda (102).
 154. Dejanira.
 155. Jurtina (104).
 156. Janira (106).
 157. Cardui (107).
 161. Iris (110).
 Populi (111).
 165. Antiopa (112).
 166. polychloros (113).
 167. Urticae (114).
 168. C. album (115).
 169. C. aureum.
 175. Atalanta (119).
 Alcmena (121).
 Leucorhoe (122).
 Acesta (127).
 similis (128).
 assimilis (129).
 dissimilis (130).
 Panopea (131).
 201. Levana (133).
 203. Lucina (135).
 204. Maturna (136).
 205. Cinxia (137).
 209. Paphia (138).
 212. Adippe.
 213. Lathonia (141).
 214. Euphrosyne (142).
 215. Niobe.
 219. Thero.
 — (Plebeii rurales).
 220. Betulae (146).
 221. Pruni (147).
 222. Quercus.
 227. Thyra.
 228. Thysbe.
 230. Arion (151).
 231. Zeuxo.
 232. Argus (152).
 Argiolus (153).

PAPILIO (Plebeii rurales) :—

236. Tesis.
 237. Rubi (154).
 238. Lara.
 239. Pamphilus.
 245. Metis.
 252. Phlaeas.
 253. Virgaureae (161).
 254. Hippothoe.
 — (Plebeii urbicolae).
 256. Comma (162).
 257. Augias.
 258. Protumnus.
 260. Thrax.
 266. Pitho.
 267. Malvae (167).
 268. Tages (168).
 — (Plebeii barbari).
 270. Niso.
 271. Spio.

SPHINX. p. 769 (489).

- ocellata (1).
 Populi (2).
 Tiliae (3).
 Convolvuli (6).
 Ligustri (7).
 Atropos (8).
 Ficus (13).
 Elpenor (15).
 Porcellus (16).
 Euphorbiae (17).
 Pinastri (20).
 stellatarum (26).
 fuciformis (28).
 Filipendulae (32).
 Phegea (33).
 Statices (38).

PHALAENA. p. 808 (495).

— Attaci.

1. Atlas (1).
 2. Hesperus.
 7. pavonia (6).
 8. Tau (7).
 17. mundana.

PHALAENA :—

— *Bombyces*.

18. quercifolia.
 19. ilicifolia (9).
 20. capensis.
 21. Rubi (14).
 22. Pruni.
 23. potatoria (11).
 24. Pini (12).
 25. Quercus (13).
 26. dumeti.
 27. Catax.
 28. lanestris (15).
 29. Vinula (16).
 31. bucephala.
 32. versicolora (17).
 33. Mori (18).
 34. Populi (32).
 - Neustria (19).
 - castrensis (20).
 - Caja (22).
 - villica (24).
 - Plantaginis (25).
 - Monacha (26).
 - dispar (27).
 - Chrysorhoea (28).
 - Salicis (29).
 - grammica (31) (822).
 - Coryli (33).
 - curtula (34).
 51. Furcula.
 56. antiqua (37).
 - caeruleocephala (38).
 - Ziczac (39).
 - Cossus (40).
 - Aulica (46).
 - lubricipeda (47).
 - Sannio (48).
 - Graminis (50).
 - cribaria (52).
 - Celsia (53).
 - Libatrix (54).
 - Capucina (55).
- *Noctuae*.
- bucephala (61).
 - Humuli (62).

PHALAENA :—

- lupulina (63).
- fuliginosa (70).
97. Batis (72).
- trapezina (73).
- lucerneae (74).
- glyphica (76).
- pallens (77).
- russula (78).
- leporina (79).
- Jacobaeae (81).
- rubricollis (83).
- complana (85).
- Pacta (86).
- Pronuba (87).
125. Fraxini (89).
- Chrysitis (90).
- Gamma (91).
- Interrogationis (92).
- Jota (93).
- Festucæ (94).
- Psi (96).
- Chi (97).
- Aceris (98).
- aprilina (99).
- occulta (101).
- umbratica (103).
- exoleta (104).
- Verbasci (105).
- exclamationis (106).
- gothica (107).
- Pinastri, MS. (108), *loco*
‘scabriuseula.’
- strigilis (109).
- C. nigrum (110).
- Brassicæ (111).
- Rumicis (112).
- Oxyacanthæ (113).
- oleracea (114).
- Pisi (115).
- triplesia (118).
- pyramidea (119).
- leucomelas (121).
- typica (122).
- lucipara (123).
- citrago (125).

PHALAENA :—

pinguinalis (232).
purpuralis (233).

— *Tineae*.

sociella (234).
colonella (235).
pusiella (236).
pulchella (238).
Evonymella (239).
Padella (240).
irrorella (241).
lutarella (242).
mesomella (243).
pascuella (244).
pratella (245).
foenella (248).
unguicella (249).
Cynosbatella (251).
vestianella (252).
tapetzella (253).
sarcitrella (255).
cucullatella (258).
graneila (259).
Lapella (260).
Arbutella (262).
vittella (264).
Xylostella (265).
mercurella (269).
Pomonella (270).
Strobilella (271).
Pinella (272).
Turionella (273).
Resinella (275).
stipella (278).
gemma (279).
bractella (280).
ramella (281).
Petiverella (283).
Swammerdamella (284).
De Geerella (286).
Roesella (297).
Rajella (298).
Clerkella (299).

— *Alucitae*.

monodactyla (300).
didactyla (301).

PHALAENA :—

tridactyla (302).
tetradactyla (303).
pentadactyla (304).
hexadactyla (305).

NEUROPTERA.

LIBELLULA. p. 901.

1. 4-maculata.
2. flaveola.
3. vulgata.
4. rubicunda.
5. depressa.
6. vulgatissima.
7. cancellata.
8. aenea.
10. juncea.
11. forcipata.
17. carolina.
20. Virgo.
21. Puella.

PHRYGANEAE. p. 908.

1. bicaudata.

HEMEROBIUS. p. 911.

1. pectinicornis.
2. Perla.
3. albus.
4. Chrysops.
5. Phalaenoides.
6. hirtus.
14. lutarius.

MYRMELEON. p. 913.

1. Libelluloides.
3. Formicarium.
4. Formicalyn.
5. barbarum.

PANORPA. p. 915.

1. communis.
2. germanica.
3. hyemalis.
4. Coa.

RAPHIDA. p. 916.

1. ophiopsis.
3. Cornuta.

HYMENOPTERA.

CYNIPS. p. 917.

18. Sycomori.
19. inanita.

TENTHREDO. p. 920 (555).

1. femorata (1) [dot under figure].
2. marginata (2).
3. lutea (2).
4. Amerinae.
lucorum (4).
5. Vitellinae.
7. fasciata (5).
8. sericea.
10. nitens (7).
11. enodis.
12. ciliaris.
13. ustulata.
14. Pini (8).
15. Juniperi (9).
ustulata (10).
16. rustica (11).
17. Scrophulariae (12).
18. Abietis (13).
20. Cerasi (14).
Salicis (15).
22. mesomela (16).
24. rufipes.
25. campestris (18).
26. atra (19).
27. viridis (20).
28. ovata.
29. Alni.
30. Rosae (21).
31. bicincta.
32. livida [=cincta] (22).
33. livida (23).
34. nigra.
36. septentrionalis (24).
37. carbonaria.
38. nassata.

TENTHREDO :—

40. erythrocephala (26).
41. sylvatica.
46. reticulata (31).
47. Betulæ.

SIREX. p. 928 (560).

1. gigas (1, Ichneumon).
2. Columba.
3. Spectrum (2, Ichn.).
4. Juvenus (3, Ichn.).
5. Camelus (4, Ichn.).

ICHNEUMON. p. 930 (560).

1. sugillatorius (5).
2. raptorius (6).
3. sarcitorius (7).
5. quæstorius.
7. infractorius.
8. constrictorius.
9. saturatorius.
11. crispatorius.
12. Pisorius (13).
13. luctatorius (14).
14. volutatorius (16).
15. vaginatorius (16).
16. pervasorius (17).
17. lituratorius.
18. designatorius (18).
19. edictorius (19).
20. deliratorius (20).
22. fossorius.
24. comitator (23).
27. reluctator.
28. denigrator.
29. desertor (28).
30. rutilator.
32. manifestator (30).
37. extensor (34).
41. Strobilellæ.
42. Moderator.
43. Resinellæ.
49. inculcator.
50. pugillator.
52. jaculator (48).
53. affectator (49).
55. luteus (51).
57. glaucopterus (53).

ICHNEUMON :—

- 58. bicolorus.
- 59. circumflexus.
- 67. Larvarum.
- 70. Secalis.
- 72. Aphidum.
- 73. Ovulorum.
- 75. glomeratus.

SPHEX. p. 941 (569).

- 1. sabulosa.
- 4. capensis.
- 8. clavipes.
- 9. Spirifex.
- 11. figulus.
- 13. sispes.
- 14. bidens.
- 16. fusca.
- 17. pectinipes.
- 21. mystacea.
- 22. ephippia.
- cribraria (6, Vespa).
- 24. clypeata.
- 28. Colon.
- 29. rufipes.
- 31. arenaria.
- 32. fossoria.
- 35. semiaurata.
- 36. leucostoma.

CHRYSID. p. 947.

- 1. ignita.
- 2. bidentata.
- 4. aurata.
- 5. cyanea.
- 7. fulgida.

VESPA. p. 948 (572).

- 1. carolina.
- 3. Crabro (1).
- 4. vulgaris (2).
- 5. rufa (3).
- 6. parietum (4).
- 7. gallica.
- 8. muraria (5).
- cribraria (6, Spheg).
- 10. spinipes (7).

VESPA :—

- rupestris (8).
- 11. coarctata (9).
- 12. arvensis (10).
- 13. campestris.
- 14. bifasciata.
- 17. biglumis.
- 18. uniglumis (12).
- 19. ruspatrix.
- 24. signata (14).
- 28. minuta.

APIS. p. 953 (574).

- 1. longicornis (1).
- 2. tumulorum (2).
- 3. clavicornis (3).
- 4. centuncularis (4).
- 5. cineraria (5).
- 7. carbonaria.
- 8. retusa (7).
- 9. rufa (8).
- 10. bicornis (9).
- 12. truncorum (10).
- 16. helvola (13).
- 20. aenea.
- 21. caerulea (16).
- 22. mellifica (17).
- 23. cunicularia (subterranea) (18).
- 24. variegata.
- 25. rostrata (20).
- 26. argillosa.
- 27. lagopoda.
- 28. manicata (21).
- 29. 4-dentata (22).
- florisomnis (23).
- 32. conica (24).
- 33. annulata (25).
- ruficornis (26).
- 38. violacea (29).
- 41. terrestris (30).
- 42. hortorum.
- 43. pratorum.
- 44. lapidaria (31).
- 45. sylvarum.
- 46. Muscorum (32).
- 47. Hypnorum (33).

APIS:—

- 48. lucorum.
- 49. brasilianorum.
- 50. acervorum (34).
- 51. subterranea.
- alpina (39).

MUTILLA. p. 966 (582).

- 1. occidentalis.
- 4. europaea.
- 5. atrata.
- 6. maura.
- 7. barbara.
- 8. helvola.
- 9. Acarorum.
- 11. ichneumonea, MS. *nomen tantum.*

DIPTERA.

OESTRUS. p. 969.

- 1. Bovis.
- 2. Tarandi.
- 3. nasalis.
- 4. haemorrhoidalis.

TIPULA. p. 970.

- 1. pectinicornis.
- 2. rivos.
- 3. quadrimaculata.
- 4. crocata.
- 5. oleracea.
- 6. hortorum.
- 7. variegata.
- 8. contaminata.
- 9. lunata.
- 10. pratensis.
- 12. cornicina.
- 13. nigra.
- 14. atrata.
- 15. bimaculata.
- 16. annulata.
- 19. flavescens.
- 21. regelationis.
- 26. plumosa.
- 27. littoralis.

TIPULA:—

- 38. Marci.
- 42. brevicornis.
- 44. febrilis.
- 46. Hortulana.
- 47. phalaenoides.

MUSCA. p. 979 (589).

- 1. plebeja (1).
- 3. chamaeleon (3).
- 4. microleon (4).
- 5. hydroleon (15).
- 7. hypoleon.
- 9. Morio (7).
- 11. Maura (8).
- 12. clavipes.
- 13. Hottentotta (9).
- 14. fenestralis.
- 15. tarda.
- 16. scolopacea (10).
- 18. tringaria (12).
- 19. diadema.
- 20. anilis.
- 21. Conopsoides (13).
- 23. leucopa.
- 25. bombylans (14).
- 26. mystacea (15).
- 27. lappona (16).
- 28. pendula (17).
- 29. florea (18).
- 30. nemorum (19).
- 31. arbustorum (20).
- 32. tenax (21).
- 33. intricaria (22).
- 34. oestracea.
- 35. fallax (24).
- 36. lucorum (25).
- 37. sylvarum (26).
- bicincta (27).
- 39. arcuata (28).
- 40. mutabilis (29).
- 42. ichneumonea (30).
- 43. diophthalma (31).
- 44. vespiformis (32).
- 45. festiva (33).
- 46. erratica (34).
- 47. glaucia (35).

MUSCA:—

48. noctiluca (36).
49. gibbosa (37).
50. Ribesii (38).
51. Pyrastrii (39).
52. transfuga (40).
53. Menthastri (41).
54. scripta (42).
55. mellina (43).
56. pipiens (44).
- segnis (45).
58. femorata (46).
61. inanis (47).
62. pellucens (48).
63. meridiana (49).
64. Caesar (50).
65. cadaverina (51).
67. Vomitoria (52).
68. carnaria (53).
69. domestica (54).
73. sepulchralis (55).
75. grossa (56).
76. rotundata (57).
78. Larvarum (58).
79. Radicum (59).
- lateralis (= canicularis, 60).
82. Coemiteriorum (61).
83. pluvialis (62).
- fenestralis (63).
85. roralis (64).
86. serrata (65).
88. meteorica (67).
89. putris (68).
90. Frit (69).
92. cupraria (71).
93. polita (72).
95. pubera (74).
96. Petronella (75).
97. unguolata (76).
99. arrogans.
104. scybalaria (79).
105. stercoraria (80).
106. finetaria (81).
107. parietina (82).
108. umbrarum (83).
109. grossificationis (84).
111. saltuum (85).
112. vibrans (86).

MUSCA:—

113. cynipsea (87).
119. Arnicae (91).
120. Hyoscyami (92).
122. germinationis (93).
123. Urticae (94).
124. Cerasi (95).
127. solstitialis (98).

TABANUS. p. 999.

1. rostratus.
3. mauritanicus.
4. bovinus.
7. Tarandius.
11. rusticus.
12. Bromius.
14. tropicus.
16. pluvialis.
17. caecutiens.
18. lugubris.
19. morio.

CULEX. p. 1002.

1. pipiens.
3. bifurcatus.

EMPIS. p. 1003.

1. borealis.
2. pennipes.
3. livida.
4. forcipata.
5. stercorea.

CONOPS. p. 1004 (604).

1. rostrata.
2. calcitrans.
3. irritans.
4. vesicularis.
5. macrocephala.
6. aculeata.
7. flavipes.
8. ferruginea.
12. buccata.

ASILUS. p. 1006.

3. barbarus.
4. crabroniformis.
6. gibbosus.
7. ater.
8. flavus.
9. gilvus.
12. germanicus.

ASILUS :—

13. forcipatus.
14. Tipuloides.
16. Morio.

HIPPOBOSCA. p. 1010.

1. Equina.
2. avicularia.
3. Hirundinis.

TESTACEA.

CHITON. (p. 661.)

- aculeatus (3).
- punctatus (4).

LEPAS. (p. 667.)

- Balanus (5).
- Tintinabulum (6).
- Testudinaria (7).
- Mitella (5).
- anatifera (9).

PHOLAS. (p. 669.)

- candidus (13).

MYA. (p. 670.)

- crispata (15).
- truncata (16).
- arenaria (17).
- lutraria (18).
- pictorum (19).
- margaritifera (20).

SOLEN. (p. 672.)

- Vagina (23).
- Siliqua (24).
- Ensis (25).
- Legumen (26).
- radiatus (28).
- strigilatus (29).
- inaequivalvis (32).

TELLINA. (p. 674.)

- virgata (35).
- fragilis (37).
- albida (38).

TELLINA :—

- planata (40).
- laevigata (41).
- radiata (42).
- rostrata (43).
- trifasciata (44).
- incarnata (45).
- donacina (46).
- balaustina (47).
- Remies (48).
- scobinata (49).
- lactea (50).
- carnaria (51).
- bimaculata (52).
- balthica (53).
- pisiformis (54).
- divaricata (55).
- digitaria (56).
- cornea (57).

CARDIUM. (p. 678.)

- costatum (58).
- Cardissa (59).
- hemicardium (60).
- echinatum (63).
- ciliare (64).
- Isocardia (66).
- Fragum (67).
- muricatum (69).
- serratum (73).
- corallinum (75).
- solidum (76).
- edule (77).
- rusticum (78).
- stultorum (80).
- virgineum (81).

DONAX. (p. 682.)

- rugosa* (84).
- Trunculus* (85).
- denticulata* (86).
- cuneata* (87).
- scripta* (88).
- Irus* (90).

VENUS. (p. 634.)

- Dione* (91).
- Dysera* (93).
- verrucosa* (94).
- Casina* (95).
- Gallina* (96).
- Chione* (100).
- maculata* (101).
- Scortum* (103).
- laeta* (104).
- castrensis* (105).
- Meroë* (107).
- deflorata* (108).
- fimbriata* (109).
- tigerina* (112).
- pennsylvanica* (114).
- exoleta* (117).
- orbicularis* (118).
- pectinata* (120).
- Lupinus* (123).
- literata* (124).
- rotundata* (125).
- decussata* (126).

SPONDYLUS. (p. 690.)

- Gaederopus* (127).

CHAMA. (p. 691.)

- Lazarus* (129).
- Gigas* (130).
- antiquata* (132).
- calyculata* (134).
- gryphoides* (137).
- bicornis* (138).

ARCA. (p. 693.)

- tortuosa* (139).
- Noae* (140).

ARCA :—

- barbata* (141).
- Pella* (142).
- lactea* (143).
- antiquata* (144).
- senilis* (145).
- undata* (149).
- Pectunculus* (150).
- Glycymeris* (151).
- nummaria* (152).
- Nucleus* (153).

OSTREA. (p. 696.)

- Jacobaea* (155).
- Plica* (162).
- Pallium* (163).
- Pes felis* (165).
- varia* (168).
- gibba* (172).
- flavicans* (173).
- Lima* (175).
- Malleus* (177).
- Folium* (178).
- edulis* (180).

ANOMIA. (p. 700.)

- craniolaris* (183).
- pectinata* (184).
- Ehippium* (185).
- Cepa* (186).
- electrica* (187).
- Squamula* (188).
- Gryphus* (192).
- Pecten* (193).
- striatula* (194).
- reticularis* (195).
- Plicatella* (196).
- crispa* (197).
- lacunosa* (198).
- fareta* (199).
- Caput serpentis* (200).
- Terebratula* (201).
- angulata* (202).
- Hysterita* (203).
- biloba* (204).
- Placenta* (205).

MYTILUS. (p. 704.)

- Crista galli (206).
- lithophagus (211).
- barbatus (214).
- edulis (215).
- anatinus (219).
- Hirundo (222).

PINNA. (p. 707.)

- rudis (223).
- nobilis (224).

ARGONAUTA. (p. 708.)

- Argo (231).

NAUTILUS. (p. 709.)

- Pompilius (233).
- Calcar (235).
- crispus (236).
- Beccarii (237).
- Spirula (239).
- Rhaphanistrum (242).
- Raphanus (243).
- Granum (244).
- Legumen (248).

CONUS. (p. 712.)

- marmoreus (250).
- imperialis (251).
- litteratus (252).
- Virgo (253).
- Capitaneus (254).
- Miles (255).
- Ammiralis (257).
- Monachus (262).
- Rusticus (264).
- ebraeus (268).
- Stercus muscarum (269).
- spinosus (271).
- Nussateia (273).
- granulatus (274).
- Aurisiacus (275).
- Magus (276).
- striatus (277).
- Textile (278).
- aulicus (279).
- Spectrum (280).

CONUS:—

- Tulipa (282).
- Geographus (283).
- Terebellum (284).

CYPRAEA. (p. 718.)

- Mappa (285).
- arabica (286).
- Argus (287).
- stercoraria (289).
- Zebra (291).
- Talpa (292).
- lurida (294).
- Vanelli (295).
- fragilis (297).
- Caput serpentis (298).
- mauritiana (299).
- Vitellus (300).
- Mus (301).
- Lynx (303).
- Isabella (304).
- Ziczac (307).
- Hirundo (308).
- Asellus (309).
- cribraria (310).
- Moneta (312).
- Caurica (313).
- Annulus (314).
- erosa (315).
- helvola (316).
- spurca (317).
- stolida (318).
- ocellata (319).
- Pediculus (322).
- Nucleus (323).
- staphylaea (324).
- Cicercula (325).
- Globulus (326).

BULLA. (p. 725.)

- Ovum (327).
- Spelta (329).
- verrucosa (330).
- gibbosa (331).
- Naucum (332).
- Hydatis (333).
- Ampulla (334).

BULLA :—

- lignaria* (335).
- Physis* (336).
- Amplustre* (337).
- pallida* (338).
- tornatilis* (342).
- solidula* (346).
- coflea* (348).

VOLUTA. (p. 729.)

- Oliva* (350).
- Ispidula* (351).
- Persicula* (352).
- monilis* (353).
- miliaria* (354).
- Faba* (355).
- glabella* (356).
- mercatoria* (357).
- rustica* (358).
- paupercula* (359).
- mendicaria* (360).
- Tringa* (361).
- Cornicula* (362).
- Sanguifuga* (364).
- Vulpecula* (365).
- plicaria* (366).
- pertusa* (367).
- Mitra* (368).
- *episcopalis*.
- *papalis* (369).
- Musica* (370).
- Vespertilio* (371).
- ebraea* (372).
- Cymbium* (374).
- Olla* (375).

BUCCINUM. (p. 734.)

- Galea* (377).
- Perdix* (378).
- Dolium* (380).
- Echinophorum* (381).
- tuberosum* (382).
- Testiculus* (387).
- decussatum* (388).
- Areola* (389).
- Erinaceus* (390).
- glaucum* (391).
- Vibex* (392).

BUCCINUM :—

- papillosum* (393).
- Glans* (394).
- Arcularia* (395).
- Pullus* (396).
- gibbosulum* (397).
- mutabile* (398).
- Neriteum* (399).
- Harpa* (400).
- patulum* (402).
- Lapillus* (403).
- spiratum* (405).
- glabratum* (406).
- virgineum* (407).
- praemorsum* (408).
- undosum* (409).
- undatum* (410).
- reticulatum* (411).
- scabriculum* (412).
- nitidulum* (413).
- laevigatum* (414).
- maculatum* (415).
- crenulatum* (416).
- strigilatum* (418).
- duplicatum* (419).
- dimidiatum* (420).
- murinum* (421).

STROMBUS. (p. 742.)

- Pes pelecani* (422).
- Scorpius* (424).
- Lambis* (425).
- Auris diana* (429).
- Pugilis* (430).
- Luhuanus* (432).
- gibberulus* (433).
- Epidromis* (437).
- Canarium* (438).
- vittatus* (439).
- urceus* (440).

MUREX. (p. 746.)

- Haustellum* (443).
- Tribulus* (444).
- cornutus* (445).
- Brandaris* (446).
- Trunculus* (447).
- ramosus* (448).

MUREX :—

saxatilis (450).
 Rana (452).
 Gyrinus (453).
 Olearium (455).
 Femorale (456).
 Pileare (458).
 Scrobilator (460).
 reticularis (461).
 Anus (463).
 Ricinus (464).
 Capitellum (465).
 Turbinellus (466).
 Melongena (472).
 scabriculus (473).
 senticosus (474).
 Ficus (475).
 Rapa (476).
 Granum (477).
 Colus (480).
 canaliculatus (483).
 perversus (485).
 antiquus (486).
 despectus (487).
 Tritonis (488).
 Tulipa (489).
 Pusio (490).
 corneus (491).
 ligniarius (492).
 syracusanus (494).
 craticulatus (495).
 Aluco (497).
 fuscatus (498).
 Radula (499).
 granulatus (501).

TROCHUS. (p. 756.)

maculatus (502).
 perspectivus (503).
 hybridus (504).
 cruciatus (505).
 pharaonius (506).
 Magus (507).
 varius (511).
 cinerarius (512).
 divaricatus (513).
 umbilicaris (514).
 vestiarius (515).

TROCHUS :—

Labio (516).
 Tuber (517).
 striatus (518).
 Conulus (519).
 Zizyphinus (520).
 dolabratus (522).
 perversus (523).
 punctatus (524).
 striatellus (525).

TURBO. (p. 761.)

obtusatus (526).
 Neritoides (527).
 littoreus (528).
 muricatus (529).
 Cimex (530).
 Pullus (531).
 Petholatus (533).
 Cochlus (534).
 Chrysostomus (535).
 Tectum persicum (536).
 Pagodus (537).
 Calcar (538).
 marmoratus (539).
 sanguineus (543).
 Argyrostromus (544).
 margaritaceus (545).
 Delphinus (546).
 Clathrus (549).
 crenatus (550).
 lacteus (551).
 striatulus (552).
 Uva (553).
 acutangulus (559).
 duplicatus (560).
 exoletus (561).
 Terebra (562).
 variegatus (563).
 ungulinus (564).
 bidens (566).
 auriscalpium (569).
 politus (570).

HELIX. (p. 768.)

Scarabaeus (571).
 Lapicida (572).

HELIX :—

Albella (574).
 striatula (575).
 algira (576).
 Leucas (577).
 complanata (579).
 Carocolla (581).
 Vortex (583).
 cornea (587).
 contorta (589).
 ampullacea (592).
 unguina (597).
 itala (598).
 hispana (599).
 perversa (601).
 janthina (602).
 Vivipara (603).
 nemoralis (604).
 decollata (608).
 Pupa (609).
 barbara (610).
 stagnalis (612).
 putris (614).
 Auricularia (617).
 perspicua (620).
 Haliotoidea (621).
 ambigua (622).

NERITA. (p. 776.)

Canrena (623).
 glaucina (624).
 Vitellus (625).
 Albumen (626).
 nodosa (628).
 Corona (629).
 cornea (631).
 fluviatilis (632).
 littoralis (633).
 lacustris (634).

NERITA :—

viridis (636).
 virginea (637).
 polita (638).
 Chamaeleon (644).
 Exuvia (646).

PATELLA. (p. 780.)

chinensis (656).
 fornicata (658).
 saccharina (660).
 barbara (661).
 vulgata (664).
 caerulea (665).
 ungarica (667).
 mammillaris (668).
 pectinata (669).
 lutea (670).
 pellucida (673).
 rustica (676).
 notata (678).
 Fissura (681).
 Pustula (682).
 nimbose (684).
 Nubecula (685).

DENTALIUM. (p. 785.)

Elephantinum (686).
 Dentalis (687).
 Entalis (688).

SERPULA. (p. 786.)

spiroboris (693).
 intricata (695).
 glomerata (697).
 lumbricalis (698).
 anguina (700).
 Penis ♀ (701).

LITHOPHYTA.

MADREPORA. (p. 793.)

turbinata (19).
 Fungites (20).
 truncata (26).

MADREPORA :—

stellaris (27).
 Organum (31).

ZOOPHYTA.

SERTULARIA. (p. 807.) See below.

1293. CORALLINA, *cf.* Proc. Linn. Soc. 1911-12, Suppl. p. 62.

The following are in the Linnean Herbarium, and when vouched for by Linné are marked with !

1294. MILLEPORA. p. 1282

(790).

- Alcyonium, Linn. MS.

- ovarium, Linn. MS.

1295. SPONGIA. p. 1296.

1296. FLUSTRA. p. 1300

(Eschara, p. 804).

1. foliacea, L. !

2. truncata, L. !

4. papyracea, L. !

1297. TUBULARIA. p. 1301

(803).

- Androsace, L. !

7. splachnea, L. !

- divaricata, L. !

1298. SERTULARIA. p. 1306

(807).

2. pumila ! (2).

4. tamarisca ! (4).

5. abietina ! (5).

6. cupressina !

8. halecina ! (10).

10. Myriophyllum ! (14).

11. falcata ! (15).

12. Pluma ! (16).

SERTULARIA :—

13. echinata !

14. antennina ! (17).

16. volubilis !

20. lendigera ! (22).

21. geniculata ! (23).

25. polyzonias ! (27).

26. Pennaria ! (30).

27. Lichenastrum ! (31).

28. cedrina ! (32).

29. purpurea ! (33).

flexuosa (34).

30. Bursaria ! (35).

31. loriculata (loricata !

36).

32. fastigiata ! (37).

34. neritina ! (38).

35. scruposa ! (39).

36. reptans !

37. parasitica !

38. ciliata !

39. eburnea !

42. anguinea.

VOLVOX, *cf.* Proc. Linn.
Soc. 1911-12, Suppl.
p. 151.

ADDITIONS and CORRECTIONS to the 'INDEX TO THE LINNEAN HERBARIUM,' published as a supplement to the 'Proceedings,' 1911-12.

Page 8, line 4 from bottom, the last word should read actual.

11, after line 33, insert COMMERSON, PHILIBERT (1722-1773), dried plants received in 1754.

14, line 40, read GERHARD.

15, ,, 13, for p. 17 read p. 18.

18, after line 6, insert WEIGEL, CHRISTIAN EHRENFRIED (1748-1831), plants from Greifswald.

18, line 33, for autumn read spring.

23, line 5 from bottom, for On read Om.

24, after line 28 insert :—

1844. NEWMAN, EDWARD. A history of the British *Equiseta* [compared with the Linnean specimens].

Phytol. i. (1884), 530-534, reprinted in his "History of British Ferns," ed. 2 (1844) 412-415. *Trans. Duval-Jouve*, Histoire naturelle des *Equisetum* de France, Paris, 1864, pp. 228-230.

1845. PARLATORE, FILIPPO. Flora palermitana... Vol. i. 8vo. Firenze 1845 [-47], xxii+442. [References to the Linnean herbarium "ex ejus herbario" throughout the volume; see also preface p. viii.]

Page 24, before 4th line from bottom, insert :—

1866. LORET, HENRI. De l'herbier connu sous le nom d'*herbier Magnol*. [Attributed by internal evidence to the younger Antoine Magnol, and a portion to Claude Chaptal.]

Bull. Soc. Bot. Fr. xiii. (1866), 101-106.

1866. DUVAL-JOUE, JOSEPH. L'herbier de Linné et les graminées françaises, d'après les travaux de MM. Ph. Parlatore, C. Hartman et W. Munro.

Bull. Soc. Bot. Fr. xiii. (1866), 106-135.

Page 25, after line 30 insert :—

1908. HITCHCOCK, ALBERT SPEAR. The American Grasses described by Linnaeus.

Contrib. U.S. Nat. Herb. xii. (1908), 114-127.

Page 26, line 3, read D. Solander.

- 51, col. 1, line 8, read Pyxidaria.
 59, ,, 2, ,, 6, ,, Alaternoides.
 ,, ,, 2, ,, 18, ,, calycinum.
 64, ,, 2, ,, 12, ,, Rhagadioloides.
 74, ,, 1, ,, 19, ,, Colpoon=Cassine capensis?
 80, ,, 1, ,, 43, ,, GINKGO.
 106, ,, 2, ,, 24, ,, *uctuosus=septicus*.
 107, ,, 2, ,, 14, ,, *Leucadendron*: cf. *Melaleuca Leucadendron*.
 111, ,, 1, ,, 34, ,, Scorpioides.
 138, ,, 1, ,, 12, for "*groecum*" read "*graecum*."
 143, ,, 2, ,, 41, read Frisea.
 148, ,, 1, ,, 20, ,, africana MS.=capensis, *Linn.f.*

INDEX.

The names of genera are in Roman type, subgenera and sections in *Italics*,
and groups in SMALL CAPITALS.

Acheta, 27.
Alucitæ, 33.
AMPHIBIA, 18.
Amphisbaena, 19.
Anguis, 19.
Anomia, 39.
Apis, 35.
Arca, 39.
Argonauta, 40.
Asilus, 38.
Attaci, 30.
Attelabus, 23.

Blatta, 27.
Bombyces, 31.
Bruchus, 22.
Buccinum, 41.
Bulla, 27.
Bulla, 40.
Buprestis, 25.
Byrrhus, 20.

Caecilia, 19.
Cantharis, 24.
Carabus, 26.
Cardium, 38.
Cassida, 21.
Cerambyx, 23.
Chama, 39.
Chermes, 29.
Chiton, 38.
Chrysis, 35.
Chrysomela, 21.
Cicada, 27.
Cicindela, 25.
Cimex, 28.
Coccinella, 21.
Coccus, 29.

COLEOPTERA, 19.
Coluber, 18.
Conops, 37.
Conus, 40.
Corallina, 44.
Crotalus, 18.
Culex, 37.
Curculio, 22.
Cynips, 34.
Cypræa, 40.

Danai, 29.
Dentalium, 43.
Dermestes, 20.
DIPTERA, 36.
Donax, 39.
Dytiscus, 25.

Elater, 25.
Empis, 37.
Equites, 29.

Flustra, 44.
Forficula, 27.
Fulgora, 27.

Geometrae, 32.
Gryllus, 27.
Gyrinus, 20.

Heliconii, 29.
Helix, 42.
Hemerobius, 33.
HEMIPTERA, 27.
Hippobosca, 38.
Hispa, 22.
Hister, 20.
HYMENOPTERA, 34.

Ichneumon, 34.
INSECTA, 19.

Lacerta, 18.
Lampyrus, 24.
Lepas, 38.
LEPIDOPTERA, 29.
Leptura, 24.
Libellula, 33.
LITHOPHYTA, 43.
Locusta, 27.
Lucanus, 20.

Madrepora, 43.
Mantis, 27.
Meloë, 26.
Millepora, 44.
Mordella, 26.
Musca, 36.
Mutilla, 36.
Murex, 41.
Mya, 38.
Myrmeleon, 33.
Mytilus, 40.

Nautilus, 40.
Necydalis, 24.
Nepa, 28.
Nerita, 43.
NEUROPTERA, 33.
Noctuae, 31.
Notonecta, 28.
Nymphæales, 29.

Oestrus, 36.
Ostrea, 39.

- | | | |
|----------------------|------------------|-------------------------|
| Panorpa, 33. | Sertularia, 44. | TESTACEA, 38. |
| Papilio, 29. | Silpha, 20. | Testudo, 18. |
| Patella, 43. | Sirex, 34. | <i>Tettigonia</i> , 27. |
| Phalaena, 30. | Solen, 38. | <i>Tineae</i> , 33. |
| Pholas, 38. | Sphex, 35. | Tipula, 36. |
| Phryganea, 33. | Sphinx, 30. | <i>Tortrices</i> , 32. |
| Pinna, 40. | Spondylus, 39. | Trochus, 42. |
| <i>Plebeii</i> , 30. | Spongia, 44. | Tubularia, 44. |
| Ptinus, 20. | Squalus, 19. | Turbo, 42. |
| <i>Pyrales</i> , 32. | Staphylinus, 27. | |
| | Strombus, 41. | Venus, 39. |
| Rana, 18. | | Vespa, 35. |
| Raphida, 34. | Tabanus, 37. | Voluta, 41. |
| | Tellina, 38. | Volvox, 45. |
| Scarabaeus, 19. | Tenebrio, 26. | |
| Serpula, 43. | Tenthredo, 34. | ZOOPHYTA, 44. |

Poworth 01/1458

